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Comments of

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In the Matter of

Protecting and Promoting the Open Internet, GN Docket No. 14-28

Preserving the Open Internet, GN Docket 09-191

Framework for Broadband Internet Service, GN Docket 10-127

July 14, 2014

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

RE: *Protecting and Promoting the Open Internet, GN Docket 14-28; Preserving the Open Internet, GN Docket 09-191; Framework for Broadband Internet Service, GN Docket 10-127*

Dear Ms. Dortch:

In several sections of the May 15th Notice of Proposed Rulemaking for the above-captioned docket, the Commission requests comment on its legal authority to promulgate new rules

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regarding Internet access.

Following the D.C. Circuit's decision in *Verizon v FCC,*[2] Chairman Wheeler and others seemed confident that the court had at last provided a blueprint for proceeding on Open Internet rules, based on statutory authority the court, agreeing with the Commission, found in Section 706 of the Communications Act.

The NPRM, however, now asks for comments on the wisdom of revisiting the possibility of regulating instead under the authority of Title II of the Communication Act.

As noted,[3] the Commission earlier requested comments on this topic in a 2010 Notice of Inquiry issued during its deliberations over the 2010 Open Internet Order.

At the time of the 2010 NOI and after, I wrote several articles urging the FCC to abandon the dangerous dead-end of proceeding under Title II, some of which are attached to this letter and submitted as comments under the current NPRM:

1. **What's in a Title? For Broadband Users, it's Oz vs. Kansas**[4] - This article reviewed the parallel histories of Title I and Title II services over the last decade, noting the serious decline of the latter and the explosive growth of the former, and why.
2. **Reality Check on Reclassifying Broadband**[5] – This article reviewed the significant legal challenges the agency would face in an attempt to change its interpretation of "information services" to include Internet access.
3. **The Seven Deadly Sins of Title II Reclassification (NOI Remix)**[6] – This paper reviewed seven specific reasons why Title II treatment for Internet access would, beyond the legal challenges of achieving this change, would lead to dangerous and unintended consequences that would vastly exceed any likely benefit.
4. **Unscrambling the FCC's Net Neutrality Order: Preserving the Open Internet, but Which One?**[7] – This article reviewed the 2010 Order in detail, including the history of Title I and

[2] *Verizon v. FCC*, 11-1355 (D.C. Cir., Jan. 14, 2014).
[3] *In the Matter of Protecting and Promoting the Open Internet*, GN Docket 14-28 (FCC May 15, 2014), ¶149.
[4] Larry Downes, *What's in a Title? For Broadband Users, it's Oz vs. Kansas*, CNET NEWS.COM, March 11, 2010, *available at* http://www.cnet.com/news/whats-in-a-title-for-broadband-its-oz-vs-kansas/.
[5] Larry Downes, *Reality Check on "Reclassifying" Broadband,* CNET NEWS.COM, April 10, 2010, available at http://www.cnet.com/news/reality-check-on-reclassifying-broadband/.
[6] Larry Downes, *The Seven Deadly Sins of Title II Reclassification (NOI Remix),* THE PROGRESS AND FREEDOM FOUNDATION, Vol. 17, Issue 15 (Aug. 2010), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2340818.
[7] Larry Downes, *Unscrambling the FCC's Net Neutrality Order: Preserving the Open Internet, but Which One?"* 20 COMMLAW CONSPECTUS 83 (2011), *available at* http://scholarship.law.edu/cgi/viewcontent.cgi?article=1480&context=commlaw.

Title II treatment, concluding that more than a dozen essential exceptions built into the 2010 Open Internet rules made clear the danger of regulating rapidly-changing infrastructure industries.

5. **Hearing on "Improving FCC Process"[8] –** My testimony before the House Subcommittee on Communications and Technology reviewed several problems with current FCC processes and procedures, including rulemakings, and proposed several modest reforms to improve the efficiency of both the regulatory process and regulatory outcomes.

6. **Hearing on "State of Wireline Communications"[9] –** My testimony before the Senate Subcommittee on Communications, Technology and the Internet reviewed several problems associated with existing Title II regulation for TDM-based telephony, recommending an accelerated retirement of the circuit-switched network and the regulations that inadvertently contributed to its obsolescence.

I offer these papers in the hopes they will assist the Commission in recognizing the danger of proceeding in the direction of Title II. Since the 2010 NOI, my views on the inapplicability of Title II regulation have only become more certain.

Title II was designed to regulate the circuit-switched telephone network during the time of the regulated AT&T monopoly and the post-breakup Bell System. That network has been unable to adapt to the transformation of communications that has accompanied the convergence of voice, video and data on the packet-switched architecture of the Internet, in large part because of the slow pace of federal and state regulatory proceedings ILECs must engage to offer new and changed services.

It would be ironic, but more to the point catastrophic, to breathe new life into Title II just as its usefulness was ready to expire on its own terms and long after its costs have grown to exceed its benefits.

The legal obstacles to proceeding under Title II remain formidable. At the very least, FCC efforts aimed at "reclassifying" broadband Internet access would likely lead to years of complicated legal proceedings—precisely the kind of regulatory uncertainty the agency is hoping to avoid. Why walk straight into this briar patch when the Commission believes it has all the authority it needs for the proposed rules under Section 706?

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[8] Larry Downes, *Hearing on "Improving FCC Process,"* Before the Subcommittee on Communications and Technology, Committee on Energy and Commerce, U.S. House of Representatives, July 11, 2013, *available at* http://democrats.energycommerce.house.gov/sites/default/files/documents/Testimony-Downes-CT-Improving-FCC-Process-2013-7-11.pdf.

[9] Larry Downes, *Hearing on "State of Wireline Communications,"* Before the Subcommittee on Communications, Technology and the Internet, Committee on Science, Commerce and Transportation, U.S. Senate, July 25, 2013, *available at* https://www.hsdl.org/?view&did=742034 .

The imperative to avoid preemptive regulation, moreover, has increased substantially since 2010. The entire Internet ecosystem, including the technology and business models for delivering broadband access, are at the center of an accelerated process of disruptive innovation my co-author and I have termed "Big Bang Disruption."[10] Big Bang Disruptors are products and services that enter the market better and cheaper than those with which they compete, upending the strategies of incumbent businesses in short order.

For incumbents to have a hope of responding effectively to these new competitors, they must become far more flexible and adaptable to change, responding sooner and more aggressively than traditional management theory has long argued.

But under a Title II regime, even one in which the FCC successfully limited through forbearance its own interference as well as the reach of state regulators, the ability of incumbent ISPs to respond to rapidly-changing technical and business disruptions certain to arrive in the coming years will be, to put it mildly, slowed.

Worse, depending on how far the Commission decided—now or in the future—to extend Title II, much if not all of the rest of the Internet ecosystem could be pulled into the tar pits along with the ISPs. Some commenters, for example, will no doubt encourage the agency to extend the Open Internet rules deep into the architecture of the Internet, to existing network management services including peering, content delivery networks, transit, Internet exchange points, backbones, virtual private networks, backhaul, specialized services, co-located servers and other crucial techniques and technologies yet to be invented.

The Commission wisely excluded these and other essential features of Internet architecture from its 2010 rules.[11] But under a Title II regime, every element of network engineering could come under the scrutiny of federal and state regulators, reaching all the way to content providers and other "edge" services, who are, after all, themselves frequently accused of violating nebulous and expanding "net neutrality" principles.

This is no hypothetical concern. In 2010, when Fox Broadcasting blocked access to its own website for customers of Cablevision during a breakdown in retransmission consent negotiations, Public Knowledge wasted no time convicting them of having "committed what should be considered one of the grossest violations of the open Internet committed by a U.S. company."[12]

PK, long an advocate for a Title II regime, made perfectly clear its view that the FCC needed enforceable rules that would apply not just to facilities-based Internet access providers but to content providers and operators of websites as well. Invoking the pending 2010 NPRM, which

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[10] Larry Downes and Paul Nunes, BIG BANG DISRUPTION: STRATEGY IN THE AGE OF DEVASTATING INNOVATION (Portfolio 2014). See also Larry Downes and Paul Nunes, *Big-Bang Disruption,* HARVARD BUSINESS REVIEW (March, 2013).

[11] *See* Downes, *Unscrambling the FCC's Net Neutrality Order*, supra note 7 at 108-116.

[12] *See* Art Brodsky, *Fox Steps Over the Internet Line*, PUBLIC KNOWLEDGE (Oct. 18, 2010), *available at* https://www.publicknowledge.org/news-blog/blogs/fox-steps-over-internet-line.

excluded a Title II option, PK noted, "Unfortunately, there was no one to call them on it."[13] That "someone" would of course be the FCC, and the "call" would be to find the practice a violation of "true" net neutrality rules.

Under a Title II regime, future strategic behavior throughout the Internet ecosystem will be similarly argued to violate common carrier principles regardless of who is involved. Advocates for Title II believe "reclassification" would give the FCC both the authority and the imperative to prohibit individuals from controlling access to their own sites. Firewalls, subscriptions, advertising, perhaps even user ids and passwords will be argued to violate the "open Internet." The FCC, under Title II authority, will be constantly pressured to act against them and other essential features of the Internet.

As the Commission has learned the hard way in the emotional response to this NPRM ***weeks before it was even publically available,*** these same self-interested parties have no hesitation to whip up Internet users with extreme rhetoric and a total void of facts. Under a Title II regime, "net neutrality" will become a formidable hammer in search of nails, one that the agency will be under constant pressure to wield from those who only claim to have the best interest of Internet users, competitive policy, and consumers in mind.

To the extent the Commission believes potential market failures make it essential to reinstate the "prophylactic"[14] 2010 rules rejected by the court, the Commission should proceed rationally and deliberately under Section 706, leaving in place the lightly regulated model for Internet access that has been central to the remarkable innovation and adoption of broadband technology of the last decade.

Respectfully submitted,

Larry Downes, Project Director
Georgetown Center for Business and Public Policy
Evolution of Regulation and Innovation Project

Attachments

[13] *Id.*
[14] Larry Downes, *What Verizon's Net Neutrality Challenge is Really About*, FORBES, Sept. 11, 2013, *available at* http://www.forbes.com/sites/larrydownes/2013/09/11/what-verizons-net-neutrality-challenge-is-really-about/2/ .

Appendices

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Appendix I

What's in a title? For broadband, it's Oz vs. Kansas

A push by Net neutrality advocates to reclassify ISPs as telecommunications providers has dangerous implications, argues Stanford Law Fellow Larry Downes.

by Larry Downes

March 11, 2010 10:00 AM PST

It was the best of times; it was the worst of times.

In 1996, Congress passed the landmark Telecommunications Act. The last major reform of communications law, the 1996 act ended Judge Harold Greene's 10-year effort to run America's telecommunications industry from his judicial chambers after the forced breakup of AT&T.

Since then, consumers have lived in two very different worlds.

One is the land of unregulated "information services." It includes, among other innovations, the World Wide Web, voice over Internet Protocol telephony, wireless applications, and cloud computing.

The other is the regulated world of "telecommunications services." It consists of traditional wireline telephones, plain and simple.

It seems pretty obvious which of these two worlds consumers prefer. In Federal Communications Commission parlance, information services are governed by Title I, while telecommunications services are regulated under Title II. If U.S. communications law were "The

Wizard of Oz," Title I would be the Technicolor dream that lies over the rainbow. Title II, on the other hand, covers the bleak, black-and-white landscape of rural Kansas.

But in the last few months, D.C.-based advocacy groups such as Public Knowledge have asked the FCC to reconsider the regulatory border that today separates Title I and Title II. The groups want the commission to reclassify broadband Internet as a "telecommunications service" and regulate it under Title II.

Such a radical change in communications law, among other things, would mean that all broadband Internet access, including DSL, fiber-optic, cable modem, satellite, and wireless technologies, could be subjected to the complex web of unbundling requirements and common-carrier rules that today apply only to telecommunications. Rates and service levels would be overseen by the FCC. Support services and private networks, including Web caching and inter-network peering arrangements, could for the first time come under federal control.

The Net neutrality tail, the broadband dog

Why would anyone propose a return to the calcified world of the pre-Internet communications industry, a world dominated by the monopoly power of the former AT&T? (The old AT&T was itself a casualty of Title II regulation in the post-1996 world. Left with only its long-distance business, AT&T lost most of its value and was acquired in 2005 by some of its former local phone company subsidiaries.)

If U.S. communications law were "The Wizard of Oz," Title I would be the Technicolor dream that lies over the rainbow. Title II, on the other hand, covers the bleak, black-and-white landscape of rural Kansas.

The short answer is Net neutrality. In October, the FCC released a 107-page Notice of Proposed Rulemaking, outlining new rules that would limit how broadband Internet providers manage their private networks . Even as the agency slogs through millions of pages of public comments on the rules, however, the FCC's authority to impose any Internet regulation is now in doubt.

In a case argued before the D.C. Circuit Court of Appeals in January, a three-judge panel viewed the imposition of neutrality rules under Title I skeptically. Many analysts believe that the court will ultimately hold that the agency has no authority to regulate Internet service providers.

The case, now awaiting decision, involves sanctions levied by the FCC against Comcast in 2008 for secretly restricting some customers' access to BitTorrent and other peer-to-peer applications . On the assumption that the D.C. court will leave the commission without the power to adopt formal Net neutrality rules under Title I, pro-neutrality groups want the agency to reclassify broadband Internet as a telecommunications service subject to Title II. Under Title II, the FCC could treat ISPs as common telecommunications carriers.

FCC Chairman Julius Genachowski has refused to rule out the possibility of reclassification, when it has come up regarding the Comcast-BitTorrent case. And during a hearing over the Comcast-NBC Universal merger on Thursday, he gave a strong indication that the FCC is considering reclassification.

"It's a major issue of global competitiveness for the United States," Genachowski said, according to The Hill. "We are defending the position that Title 1 [classification] gives us the authority we need. We'll continue to assert that position and hope we will get a favorable decision. If the court does something that requires us to reassess, we'll do that."

This has provided little comfort to the communications industry. Not surprisingly, leading industry associations have reacted violently to the idea of subjecting Internet access to the full regulatory might of the FCC. In late February, a letter (PDF) signed by industry associations of the cable, wireless, and telecommunications industries, as well as leading providers AT&T, Verizon Communications, and Time Warner Cable, condemned the proposed reclassification as a "radical" move, one that "at a minimum, would plunge the industry into years of litigation and regulatory chaos."

That's a very real concern. Reclassification would put the agency squarely at odds with the 2005 Brand X case, the culmination of years of litigation over cable modem service. In Brand X, the FCC successfully argued before the U.S. Supreme Court that broadband Internet access was clearly a Title I service. Any effort to reverse that decision would, if nothing else, kick off another round of withering lawsuits.

Whatever one thinks of the wisdom of having the FCC ensure the continued openness of the Internet through the proposed Net neutrality rules, achieving that goal through reclassification would be the worst example in history of a tail wagging the dog. It may even be the worst idea in communications policy to emerge in the last 75 years--that is, since the commission was first created in 1934.

The two titles

To understand why, we need only review the parallel histories of life under Title I and Title II since the 1996 Act.

Consider life since then under the largely unregulated Title I. Internet access has improved in every measure. Data communications speeds have increased exponentially, major new technologies including fiber optics and 3G/4G wireless have emerged, and even traditional voice applications have been adapted to the nonproprietary, packet-switched protocols of TCP/IP. Consumers in all but the most remote parts of the country can choose between a variety of ISPs, including cable, wireline, wireless, and satellite providers, many of which offer bundled packages of phone, television, and Internet services.

On the assumption that the D.C. court will leave the commission without the power to adopt formal Net neutrality rules under Title I, pro-neutrality groups want the agency to reclassify broadband Internet as a telecommunications service subject to Title II.

Verizon and AT&T have spent billions of dollars to implement next-generation fiber-optic networks capable of carrying voice, data, and high-definition video services, while cable companies have upgraded their networks to remain competitive. Wireless networks have expanded as well, encouraging millions of consumers worldwide to abandon their landlines in favor of cellular technology, which offers voice and data with the convenience of an untethered connection. Satellite providers have also invested heavily to compete in the market for high-speed data communications.

Since the 1990s, standard dial-up modem speeds of 300 bits per second increased quickly to 56,000bps using the old copper network. Then came broadband. Cable modems were introduced in 1996, offering speeds up to 1.5Mbps. DSL emerged soon after, and wireless Internet over the cellular network after that. In 2000, about 5 million American homes had broadband. By 2008, that number had increased to more than 80 million. Broadband access is now available to 96 percent of American homes , according to recent FCC figures.

As bandwidth became more readily available, ISPs moved from the hourly billing model of America Online in the mid-1990s to more or less unlimited and unmetered usage, paving the way for always-on applications, video services such as YouTube, social networking, and other so-called Web 2.0 services.

Today, popular broadband speeds range from 2Mbps to 6Mbps , offered at a flat rate of about $40 per month. In addition to the Web, Internet users can watch television and movies, obsess over Twitter and Facebook, enjoy thousands of 3G and soon 4G apps, and even use public data networks for old-fashioned voice communications using Skype, Vonage, and other VoIP software. Cable companies now offer local and long-distance phone service over their networks, as well as Internet access and high-definition video.

By comparison, life under Title II has stagnated, at best. Under the 1996 Act, the FCC was required to force open local phone service to unlimited competition. With access to the legacy carriers' network and equipment guaranteed, and prices overseen by the FCC, thousands of new local phone companies emerged. These new providers had no infrastructure of their own to build or maintain, and they largely competed with the legacy carriers and each other on price. Many had no experience in the communications business, existing only to arbitrage the regulations.

Abuse of the system is still rampant. In remote areas, the new local phone companies partnered with chat lines and teleconferencing services to pump incoming phone calls to areas

that otherwise had little traffic, sharing the proceeds of mandatory interconnection fees imposed on the originating carrier.

Many urban carriers offer flat-rate service to customers, forcing the provider to eat the cost of the interconnection fees. (Google Voice, a Title I information service, today refuses to connect to some of these services , an option unavailable to Title II telecommunications services, which, as common carriers, must connect all calls.)

With limited demand for local phone service and little to distinguish the carriers, by 2000, most of the new phone companies had gone broke. In 2002, then-FCC Chairman Michael Powell summed up the state of telecommunications: "This is an industry suffering--there have been nearly 500,000 jobs lost, a reported $2 trillion of market value extinguished, and by some estimates, companies are laboring under $1 trillion in debt."

By and large, the business side of Title II has only gotten worse. Accounting scandals at long-distance provider WorldCom heaped further pain on the traditional phone industry, which has, by most measures, never recovered. Faced with unregulated competition from VoIP carriers and cable companies, traditional phone companies are now backing away as quickly as they can from the most unprofitable areas of their business, leaving some customers with fewer options for standard telephone services.

Unintended consequences

Given the stark contrast between life under Title I and Title II, it's no surprise that there's been little call for relocating ISPs. Until now, in fact, the FCC has led the charge to keep information services out of the hornet's nest of Title II regulation--regulation that has largely destroyed legacy phone service. The commission determined in 2002, for example, that cable modem broadband, even if it included voice communications, was an information service. In 2005, after it successfully defended that position in the U.S. Supreme Court, the FCC ruled that wireline broadband was likewise a Title I service. In 2007, the agency extended that treatment to wireless broadband (PDF).

A reclassification of information services to Title II would cast a net much wider than just ISPs.

The results speak for themselves. We now have a vibrant, expanding Internet economy, one of the few bright spots on the economic scene. Broadband providers have invested hundreds of billions of dollars in the Title I networks, even as Title II services languish and die. As the FCC prepares to issue its long-awaited National Broadband Plan next week, the agency itself acknowledges achieving its goal of 100Mbps access for 100 percent of American homes will require an additional $350 billion in infrastructure costs.

Under Title I, those investments are likely to continue being made by the private sector. Reclassified under Title II, however, infrastructure improvements will come to a screeching halt. Wall Street is already terrified. Moving broadband Internet to Title II, according to Craig Moffett of Bernstein Research, would lead investors to "run for the hills."

It's possible that Congress will choose instead to nationalize broadband provisioning and make the necessary investments out of tax revenues--a kind of federal-highways plan for the information age. But the political will for massive new government infrastructure is clearly lacking. In the current economic climate, we'd be more likely to get the money from the tooth fairy than from Congress.

Worse, a reclassification of information services to Title II would cast a net much wider than just ISPs. Companies that provide Internet backbone and caching services, including Level 3 Communications and Akamai Technologies, could likely find themselves treated as common carriers. Bandwidth-peering arrangements in which companies voluntarily connect their networks for greater redundancy and increased transmission speeds, might also be considered a "telecommunications service."

In a Title II world, Internet services from the core to the edge of the network could be swept into a regulatory regime designed in the 1930s to control the monopoly of a company that no longer exists. Services that have never before been subject to FCC regulation, including cloud computing and search, could be subjected to unbundling and rate setting, limited only by the FCC's discretion under its "forbearance" powers.

Even if it means the end of the proposed Net neutrality rules, the FCC would be foolish to heed the siren call to regulate broadband as a telecommunications service. Title II is a relic of ancient communications history, not a cure-all for real and imagined limits of our broadband future.

Let's stay on the Yellow Brick Road that's taking us happily to the digital Oz. Let's not ever go back to Kansas.

Appendix II

Reality check on 'reclassifying' broadband

The legally explosive concept of regulating Net access under Title II is one for Congress to handle (and reject), argues Stanford Law Fellow Larry Downes.

by Larry Downes

April 19, 2010 12:39 PM PDT

Even before the D.C. Circuit's decision in Comcast v. FCC , a great deal of ink has been spilled over speculation that the FCC will rescue its marooned Net neutrality rulemaking by "reclassifying" broadband Internet access as a "telecommunications service" under Title II of the Communications Act. (Some of that ink has been my own .)

Earlier last week, FCC Chairman Julius Genachowski refused to rule out that possibility, telling a Senate Committee that "we haven't settled on a path forward."

But regulating Internet access after leaving it largely alone all these years would be much more difficult than most people think. There are serious legal obstacles to overcome, some of them substantial. Along the way, lawmakers, courts, and consumers are likely to oppose the FCC's means, even if they support the goal of enacting the proposed Net neutrality rules.

Regulating Internet access under Title II opens it to a wide range of possible regulation and plenty of unintended consequences.

That's in part because regulating Internet access under Title II opens it to a wide range of possible regulation and plenty of unintended consequences. Under Title II, for starters, the FCC would have the power to subject Internet access to the full set of common-carrier provisions. These include federal, state, and even municipal oversight on rates, forced sharing of

equipment (with any competitor who asks) at fees refereed by the FCC, and new taxes collected on behalf of the Universal Service Fund, which today is used to provide basic phone service to those who cannot otherwise afford it.

Legal landmines everywhere

Fears of some dangerous, legally sanctioned monopoly controlling the broadband market are few and far between. Yet such a monopoly is the reason the Title II rules were created. Common-carrier rules date back to the Stone Age--back, that is, when the old AT&T, a "legal monopoly," was the only company offering telecommunications service and equipment.

Those rules predate the breakup of the Bells. They came before cable companies got into the data and phone business, before the World Wide Web was woven, before cellular, satellite and fiber-optic connectivity became commonplace, and before iPhones, Google, and well, you get the idea.

Law professors, pundits, stock analysts, and journalists are all grossly oversimplifying the gory details of administrative law by implying or, in some cases, saying outright that the FCC can switch to the old rules as soon as it decides to do so. Some should know better. "The FCC has the legal authority to change the label, as long as it can provide a good reason," University of Michigan Law professor Susan Crawford wrote in The New York Times earlier this month.

That's wishful thinking. Well beyond the dubious goal of getting Net neutrality rules on the books, there are very good reasons that making the change would prove a tough slog. In order to treat broadband Internet access as a Title II service, the FCC would need to navigate a minefield of legal obstacles established to avoid just this kind of regulatory landgrab.

Nothing in the Communications Act gives the FCC authority to decide on its own what is and what is not a telecommunications service. Congress already made that decision. That broadband Internet is an unregulated "information service" is already long-settled law, law made concrete by the FCC itself.

For starters, nothing in the Communications Act gives the FCC authority to decide on its own what is and what is not a telecommunications service. Congress already made that decision. That broadband Internet is an unregulated "information service" is already long-settled law, law made concrete by the FCC itself.

Since the 1996 revisions that introduced the distinction, the agency under Democratic and Republican administrations alike has consistently and loudly argued that, at the very least, broadband Internet through the cable system is not, and never was meant to be, a telecommunications service. That was an argument the agency made to the U.S. Supreme Court in 2005's Brand X case, when a Southern California ISP challenged the refusal of a local cable

company to give it access to its equipment--access it compared to its legally sanctioned use of the local phone company's infrastructure.

The question in Brand X was not which title made more sense for broadband Internet. *The question was where Congress put broadband when it passed the 1996 Act.* The FCC argued successfully that the definition of information services included cable Internet service. Later, the agency decided that Internet access offered by traditional phone companies was also an information service under Title I, at least for DSL speeds. (Dial-up Internet is still treated as a telecommunications service under Title II.)

Data communications has always been an information service

Brand X was no mistake. The idea that information services should remain unregulated dates back well before the Internet, to the development of early data communications applications. Companies such as IBM and DEC developed proprietary network architectures and offered services to their customers using leased phone lines. The old Bell monopoly was forbidden to offer competing services until the company's court-ordered breakup in 1984.

By 1996, when Congress finally rewrote the law to reflect the breakup, using the telephone network for data transmission was a well-established feature of "distributed" business computing. Consumer data communications was also growing rapidly through the likes of AOL, Prodigy, and CompuServe. The Internet was becoming a popular protocol for that communication, and the Web had been around since 1993.

There was no question in 1996 of bringing all that innovation under rules created to control the old AT&T. Rather, the debate was over how much of the old rules were still needed 11 years after the monopoly had been broken up. There was even serious consideration given to deregulating everything and disbanding the FCC, much as Congress had done with the airline industry and its former regulator, the Civil Aeronautics Board, or the railroad industry and the now-defunct Interstate Commerce Commission.

Resistance would not be futile

Given this long and unbroken history, any effort to "reclassify" broadband without Congressional action would be met with vigorous legal challenges every step of the way.

There was no question in 1996 of bringing all that innovation under rules created to control the old AT&T. Rather, the debate was over how much of the old rules were still needed 11 years after the monopoly had been broken up.

Although the objective of that fight might simply be to enact Net neutrality rules and otherwise leave broadband providers alone (for now), expect to find some odd bedfellows joining the resistance. The communications industry, which has operated for the last several years under

the belief that unregulated broadband Internet was settled law, would lead the charge. But there are plenty of other constituencies that would object to the FCC's playing fast and loose with its governing statute.

That includes members of Congress who might otherwise be sympathetic to the Net neutrality cause but worried about an agency usurping legislative power. The courts, which believe that they are the only ones that get to reverse court decisions, might also prove hostile to the idea of upending Brand X on the mere promise of a "good reason."

Consumers, too, might find common cause with the antireclassification movement. Even if some consumers like the idea of FCC-enforced Net neutrality rules, most Americans are justifiably skeptical of untethered legislating by unelected civil servants.

Consider reaction to an alternative policy decision the FCC hasn't made but plausibly could make. Today, the agency enforces its decency rules--you know, swear words and wardrobe malfunctions--with enthusiasm against broadcast radio and television networks, but has never done so against cable television.

Suppose, armed with the "good reason" that America is sinking into a culture abyss, the FCC similarly decided to "reclassify" cable programming and started to hand out fines to nearly every show on HBO, Showtime, and Comedy Central?

Hypotheticals aside, the FCC has given consumers plenty of reasons to doubt its unilateral determinations of what's best. In 2002, for example, the agency enacted rules that required manufacturers of televisions and other devices capable of receiving digital-television signals to introduce "broadcast flag" technology. The broadcast flag, urged by large media companies, would have allowed broadcasters to automatically control how, or even if, their programs could be copied to DVRs and other time-shifting devices.

As in the Comcast case and the proposed Net neutrality rules , the agency relied solely on its ancillary jurisdiction in issuing the rules. Again the D.C. Circuit shot them down (PDF), in language that closely parallels the Comcast decision. "Are washing machines next?" one judge asked incredulously at oral argument. Said another: "You can't rule the world."

Indeed. Congress had good reason for keeping Internet access out of the FCC's clutches in 1996. Very little that has happened since then suggests that the decision was anything but brilliant foresight. But even if that's wrong, putting the Internet under Title II would be a radical change in policy--one to be made by Congress, not the FCC or its cheerleaders.

Whether one is for or against the new rules proposed by the FCC in October to make itself the "smart cop" on the Internet beat , getting there by blowing up years of settled law and sensible legal and policy choices dating back to the breakup of the old AT&T is a terrible idea. And we already have plenty of those.

Appendix III

(Attached as separate PDF)

Appendix IV

(Attached as separate PDF)

Appendix V

Hearing on "Improving FCC Process"

Before the Subcommittee on Communications and Technology
Committee on Energy and Commerce
U.S. House of Representatives

Written Testimony of Larry Downes[15]
Internet Industry Analyst and Author

July 11, 2013

Chairman Walden, Ranking Member Eshoo and members of the Subcommittee, thank you for this opportunity to testify on the importance of reforming processes at the FCC.

My name is Larry Downes. Based in Silicon Valley, I am an Internet industry analyst and the author of several books on the information economy, innovation, and the impact of regulation. I have also written extensively on the effect of communications regulation on the dynamic broadband ecosystem, and in particular the role played by the FCC. I include several of my prior publications in an Appendix.

Summary

As the nature of technological innovation has both accelerated and mutated in the last decade,[16] the FCC's inability to eliminate needless roadblocks for entrepreneurs and incumbents alike has reached a breaking point. The agency continues to tinker with 21st century problems using a 19th century toolkit. Many of the agency's processes are badly in need of reform and structure. They lack economic rigor, transparency, expediency or consistency.

As Ronald Coase famously wrote, "If you torture the data long enough, nature will always confess."[17]

That, in a nutshell, has become the FCC's unintended *modus operandi*. The agency collects the data it needs to make wise and efficient decisions, but in the absence of clear guidelines and the most basic

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[16] *See* Larry Downes and Paul F. Nunes, *Big Bang Disruption*, Harvard Business Review 44 (March, 2013); *A New Kind of Disruption*, HARVARD BUSINESS REVIEW 20 (May, 2013).
[17] Ronald H. Coase, *How Should Economists Choose?* in ESSAYS ON ECONOMICS AND ECONOMISTS 27 (University of Chicago Press 1994).

economic analysis, the Commission cannot resist the temptation to abandon the logical conclusions compelled by that data in the service of vague, idiosyncratic, transient and, often, unarticulated policy goals.

The lack of structure wastes both government and private resources. Worse, it vastly underemphasizes the likelihood that imminent technology disruptors will better and more efficiently advance the communications needs of American consumers with far fewer unintended consequences.

These problems devalue much of the good work of the agency's staff and subvert the often admirable goals of the FCC's Chairmen and Commissioners. They have created an epidemic of negative side-effects, including:

- Many of the agency's reports fail to reach obvious conclusions supported by the thorough data collection the agency performs, limiting their usefulness as policy tools to advance the FCC's longstanding charter to promote communications to all Americans.

- Rulemakings torture their analysis and data to justify what appear to be *ex ante* conclusions to regulate — regardless of the need or cost.

- The value to consumers of license transfers aimed at avoiding an imminent spectrum crisis are dissipated by the unchecked growth of laundry lists of unrelated conditions, many of which become counter-productive or mooted by technological advances years before they expire.

- Recent spectrum auctions have been poisoned by similar policy interventions. The 2008 700 MHz auctions were so weighed down with conditions that the most important auctions failed. The "C" Block auction left billions of dollars on the table. The "D" Block didn't even meet its minimum bid.[18]

In the absence of formal guidelines and processes to complete these core activities, the FCC enjoys considerable flexibility to deal with a fast-changing market. But that informality leaves the agency with no useful mechanism for determining whether any particular intervention will serve consumers more efficiently than simply allowing technological evolution to take its natural course.

[18] Larry Downes, *A Strategic Plan for the FCC: The Future Ain't What it Used to Be*. FORBES (DEC. 5, 2011), http://www.forbes.com/sites/larrydownes/2011/12/05/a-strategic-plan-for-the-fcc-the-future-aint-what-it-used-to-be-2/; *see also* Gerald R. Faulhaber & David J. Farber, *The Open Internet: A Customer-Centric Framework*, 4 INTERNATIONAL JOURNAL OF COMMUNICATION 302 (2010), *available at* http://ijoc.org/index.php/ijoc/article/viewFile/727/411.

Worse, the lack of structure has left the FCC with the mistaken impression that the agency can predict an increasingly unpredictable future, and design what it calls "prophylactic" remedies for consumer harms that have yet to occur.

In effect, the Commission's decision-making process is at war with the agency's own data.

Given rapid changes in the broadband ecosystem, the FCC, of course, needs some measure of flexibility to complete its statutory mission. But applying that flexibility ungrounded by neutral principles, guidelines, and analytic processes invariably does more harm than good.

As markets have become more dynamic thanks to the accelerating introduction of disruptive computing and communications technologies, the FCC has simply dug in its heels, basing its decisions on a strangely siloed view of the industries it oversees. This unstructured approach becomes more dangerous and more anachronistic every day. When push comes to shove--as it always does--the FCC has demonstrated a dangerous and growing tendency to ignore its own data and go with its gut, or worse.

The dynamic nature of the markets and industries the agency oversees requires a 21st century FCC. The agency urgently needs neutral, streamlined, and balanced decision-making processes. With them, the agency could become a genuine partner, accelerating adoption of new technologies and the economic growth that goes with them. Without them, the agency will increasingly stand as an obstacle to achieving the broadband ecosystem's full potential to improve the lives of all Americans.

The foundations for a more productive role for the FCC—a role consistent with the agency's long-stated statutory purposes--are already in place. In preparation for the many reports the agency is required to produce, agency staff have become adept at collecting and reporting vast troves of useful information regarding market conditions, consumer behavior, and competition.

These reports describe an increasingly complex communications ecosystem in which all manner of content is now being delivered on converged IP networks, and in which market discipline comes not just from direct competitors but from every participant in the ecosystem—including device makers, software developers, service providers, and consumers themselves.

Yet in *applying* that data, whether in reports, rulemakings, amendments, orders, auction designs or transaction reviews, the agency has no process, or at least none based on the uncontroversial principles of basic cost-benefit analysis. With nothing more than the undefined "public interest" lens through which to squeeze this mountain of data, the agency's processes have become unstructured, ranging dangerously far from both statutory and Constitutional limits.

Congress can easily ameliorate the worst symptoms of this breakdown. The two discussion draft bills before you, Federal Communications Commission Process Reform Act of 2013 (HR 3309 in the 112th

Congress) and Federal Communications Commission Consolidated Reporting Act of 2013 (HR 3310 in the 112th Congress),[19] provide many common-sense, modest, apolitical repairs, imposing needed structure on the Commission's processes.

This testimony briefly highlights the negative unintended consequences that unstructured reviews are causing, particularly in the broadband ecosystem. I also offer suggestions for additional process controls that are acutely needed as the FCC's role in rapidly evolving technology markets becomes more determinative.

In short, as those of us in the technology industries have learned the hard way, the pace of change has long-since outrun our ability to predict the future, even in the short-term. The FCC must be cured of its counter-productive habit of micromanaging markets that are evolving even as the Commission deliberates. It must weigh the costs of intervention against the likelihood that even demonstrable market failures are increasingly resolved by the imminent next generation of technology, often deployed by enterprises, entrepreneurs and competitors that didn't exist when the agency began its review. And it must focus its remedial and regulatory efforts on relevant consumer harms that are tangible and solvable with both precision and measurable efficacy.

Transaction Review

The FCC's process failures are most painfully visible in the agency's transaction review process--in precisely the area where grounded approaches are most urgently needed. Here, the Commission's inability to keep pace with changing technological and competitive dynamics has created a long list of negative unintended consequences, including:

- Long delays in processing applications for license transfers that accompany mergers, acquisitions, and other financial transactions, even as technological disruption accelerates and consumer demand for services explode. Transfers delayed are consumers unserved.
- Needlessly burdensome conditions and "voluntary" commitments that stifle competition rather than preserving it, many unrelated to the actual transaction.
- Inconsistent restrictions applied at different times to different licensees in the same industry that reduce transparency and increase consumer confusion.
- Long periods of expensive and distracting post-transaction reporting, monitoring, and enforcement by the FCC, with no mechanism to determine if technology and market changes have eliminated the need for some conditions, or rendered them counter-productive.

[19] Discussion Draft, *Federal Communications Commission Process Reform Act of 2013,* http://docs.house.gov/meetings/IF/IF16/20130711/101107/BILLS-113pih-FCCProcessReformAct.pdf (July 11, 2013); Discussion Draft, *Federal Communications Commission Consolidated Reporting Act of 2013*, http://docs.house.gov/meetings/IF/IF16/20130711/101107/BILLS-113pih-FCCConsolidatedReportingAct.pdf (July 11, 2013).

- Duplicative review, using different standards and different burdens of proof, with merger reviews conducted on related transactions by the Department of Justice.[20]

There is an acute need for process reform in the agency's review of license transfers. As someone who works not in Washington but in Silicon Valley, I speak daily with entrepreneurs, innovators, and venture investors. We are now spending more and more of our time dealing with what the FCC accurately termed in 2009 the "spectrum crisis,"[21] which threatens to slow or even stall the remarkable engine of innovation that is the broadband ecosystem. Already, that crisis has foreclosed valuable innovations and services that could instead be serving the insatiable demands of mobile customers.

Consumers across the world have embraced inventions in mobile computing, most of which continue to originate in the U.S., faster and more enthusiastically than any previous technological innovation we've created. The broadband ecosystem has provided what has sometimes been the lone bright spot on our struggling economy.

But as the National Broadband Plan (NBP) acutely recognized, U.S. consumers, especially in urban areas, are so eager to embrace the latest mobile devices, services, apps and content that they are challenging the natural limits of existing networks to continue to satisfy demand.

Since 2009, remarkably, smartphone adoption has jumped from 30% to 67%.[22] Network traffic has continued to more than double year over year since 2007.[23] Overall, wireless innovation supports nearly 3.8 million American jobs today and contributes nearly $200 billion to the economy.[24] These are just a few of the metrics reported by the FCC; job creation, economic value, U.S. competitiveness, and other measurements have similarly risen.

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[20] In the Verizon-SpectrumCo transaction, the FCC attached competition-related conditions to joint marketing and other commercial agreements that were part of the overall deal but which did not include the transfer of licenses. Whether ancillary or unrelated agreements have anticompetitive effect, however, is appropriately the province of the Department of Justice. Their effect on competition is best measured under the antitrust laws, not the "public interest" standard. If the FCC continues to assert jurisdiction over such agreements as part of its public interest review, its evaluation of license transfers will quickly transform into unfettered authority to regulate any aspect of the merged entity's business. This not only duplicates DOJ review, it also does so under a standard that lacks any clear limiting principles or analytical rigor.

[21] Prepared Remarks of Chairman Julius Genachowski of the Federal Communications Commission, *America's Mobile Broadband Future*, International CTIA WIRELESS I.T. & Entertainment in San Diego, CA (Oct. 7, 2009), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-293891A1.pdf.

[22] Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services, Sixteenth Report ¶ 349 (Mar. 21, 2013), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-13-34A1.pdf (hereinafter 16th Annual Mobile Competition Report).

[23] *Id.* at 12.

[24] Roger Entner, *Entner: Managing Market Share By Restricting Spectrum Ownership – Warnings of a Managed Economy?* Fierce Wireless (June 8, 2013), http://www.fiercewireless.com/story/entner-managing-market-share-restricting-spectrum-ownership-warnings-manage/2013-06-08.

To support this unparalleled growth, the NBP conservatively estimated that mobile network operators would require an additional 300 MHz of dedicated spectrum by 2015 and 500 MHz by 2020.[25] But for the first time in our history, there is almost no available inventory of usable and unassigned frequencies. The spectrum frontier is now effectively closed.[26]

To their credit, Congress, the FCC, and the White House have worked hard to keep the broadband economy booming. This Subcommittee, on a bi-partisan basis, has done much to support that effort, including introducing legislation authorizing the FCC to conduct Voluntary Incentive Auctions (VIA) (which became part of the Middle Class Tax Relief Act),[27] and requesting monthly status updates from federal agencies on their efforts to free up spectrum for consumer services.[28]

Congress has rightly determined that over-the-air broadcasters and federal government assignees are the most promising sources for unlocking unused and underutilized frequencies that would achieve better and higher use by broadband consumers.

So far, unfortunately, we have little to show for this hard work.

The Voluntary Incentive Auctions have not kept up with the schedule originally proposed by the FCC. And even if VIA design and execution had not become bogged down, it would, realistically, have taken at least a decade to bring new spectrum online—well past the NBP's doomsday clock for the spectrum crisis. And despite now two strongly-worded Memoranda from the White House, federal uses, notably the Department of Defense,[29] have been slow to acknowledge the President's insistence that the federal government cooperate in the FCC's efforts to provide up to 500 MHz by 2020.[30]

As a result of delays and roadblocks, network operators are working overtime to squeeze out additional value from current spectrum licenses by improving the efficiency of existing networks. They are deploying

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[25] National Broadband Plan, *Goals and Action Items*, Broadband.gov, p. 26 (last visited July 9, 2013), *available at* http://www.broadband.gov/plan/goals-action-items.html.
[26] Larry Downes, *Averting a Spectrum Disaster: Now for the Hard Part*, CNET (Feb. 25, 2012), http://news.cnet.com/8301-1035_3-57385202-94/averting-a-spectrum-disaster-now-for-the-hard-part/.
[27] Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96 (codified at 47 U.S.C. § 1422 (2012))
[28] *See* Gary Arlen, *House Commerce Committee Wants Monthly Updates From Federal Agencies on Spectrum Realignment*, BROADCASTING & CABLE (June 28, 2013), http://www.broadcastingcable.com/article/494285-House_Commerce_Committee_Wants_Monthly_Updates_From_Federal_Agencies_on_Spectrum_Realignment.php.
[29] *See* Presidential Memorandum: Unleashing the Wireless Broadband Revolution (June 28, 2010), *available at* http://www.whitehouse.gov/the-press-office/presidential-memorandum-unleashing-wireless-broadband-revolution; *see also* Presidential Memorandum: Expanding America's Leadership in Wireless Innovation (June 14, 2013), *available at* http://www.whitehouse.gov/the-press-office/2013/06/14/presidential-memorandum-expanding-americas-leadership-wireless-innovatio.
[30] National Broadband Plan, *see supra* note 25.

new technologies, including fiber backhaul, smaller cells and smart antennas.[31] And they are doing what they can to get existing customers to migrate to more spectrum-efficient protocols, notably 4G LTE. (The U.S. already leads the world in LTE adoption, with over half of the world's total LTE connections.[32])

The most effective tool for deferring the spectrum crisis so far, however, has been to make innovative use of secondary spectrum markets. These markets allow willing parties to transfer spectrum already licensed for mobile applications among themselves.

As the FCC reports, licensees have completed over a dozen major spectrum transfer transactions since 2007. Secondary markets have enabled license holders such as SpectrumCo to dispose of valuable spectrum that had long sat idle. In other cases, carriers have used the secondary markets to divest licenses in frequencies that are more complementary to the networks of others, and to acquire spectrum that better fits their own portfolio.

In every example, these market transactions have served the policy goal of putting limited spectrum capacity to better and higher uses.

The secondary markets, however, are severely constrained by outdated FCC transfer procedures and policies. And license transfers, by law, are subject to FCC approval.[33] According to the Communications Act, license transfers freely negotiated will nonetheless be rejected unless the FCC makes a finding that the transfer is in "the public interest."

But the public interest standard has never been defined, nor has Congress imposed any rigor on the how the agency applies it. As a result, over the last several years, the agency has demonstrated a disturbing willingness to use its gatekeeping role to advance a wide variety of conflicting and unrelated policy agendas.

With little to guide or constrain such reviews, the FCC's application of the public interest standard has become increasingly unstructured. In the last few years, for example, the agency has shown a dangerous tendency toward "mission creep," using license transfer proceedings to advance unrelated and often eccentric policy agendas or otherwise evade restrictions on agency jurisdiction imposed by Congress. Worse, the agency's often-lengthy transaction-related orders are rendered incoherent by a growing

[31] Their ability to do so, however, is limited by the slow pace of local approval for all manner of infrastructure improvement, including replacing existing equipment, adding new equipment to existing cell towers and utility poles, and construction of new towers. *See* Larry Downes, *Does Your iPhone Service Suck? Blame City Hall*, CNET (Sept. 8, 2011), http://news.cnet.com/8301-1035_3-20102911-94/does-your-iphone-service-suck-blame-city-hall/.
[32] Jonathan Spalter, *Spectrum for Brighter Mobile Future*, MOBILE FUTURE (June 26, 2013), http://mobilefuture.org/spectrum-for-brighter-mobile-future/.
[33] Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (1996) (amending 47 U.S.C. § 310(d) (2012)).

opaqueness in the methods, analysis, and processes used in transaction reviews. Such reviews increasingly appear cobbled together after the fact to support ex ante decisions based on unstated policy goals.[34]

The FCC's unstructured role has become a bottleneck that threatens the health and dynamism of the broadband ecosystem--the exact opposite of the part the agency should and intends to play. Transfers delayed are consumers unserved. "Prophylactic" conditions intended to remedy potential competitive harms become millstones on the necks of licensees, leaving them unable to respond quickly to rapidly-changing technological and market conditions. Inconsistent rulemakings in the guise of transaction conditions lead to consumer confusion and less, not more, transparency into FCC decision-making.

As the scope of transaction reviews inexplicably expands, for example, reviews take longer, involve messier public records and agency inquiries, and attract more self-serving intervention from competitors and lobbyists. The FCC's review of Sirius's acquisition of XM Radio took seventeen months to complete. Comcast-NBC Universal was approved after ten months, while AT&T/T-Mobile was rejected after seven months. The Verizon-SpectrumCo deal went through, with significant conditions, in eight months.[35]

Transactions that are approved now come with comically-long lists of conditions, including divestitures of some customers or spectrum aimed vaguely at preserving competitive equilibrium even as the market shifts before the ink is even dry on license transfer orders.[36]

The result has been a free-ranging and increasingly drawn-out process, where the agency sometimes imposes over a hundred conditions, some imposed directly and others taking the form of "voluntary"

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[34] Larry Downes & Geoffery A. Manne, *The FCC's Unstructured Role in Transaction Reviews*, 1 CPI ANTITRUST CHRONICLE 1 (2012); *See also* Larry Downes, *The FCC Scores a Hat Trick of Errors on Internet Regulation*, FORBES (Aug. 27, 2012), http://www.forbes.com/sites/larrydownes/2012/08/27/the-fcc-scores-a-hat-trick-of-errors-on-internet-regulation/.

[35] *See* Memorandum Opinion and Order and Report and Order, *In the Matter of Applications for Consent to the Transfer of Control of Licenses XM Satellite Radio Holdings Inc., Transferor, To Sirius Satellite Radio Inc., Transferee*, FCC 08-178, MB Docket No. 07-57 ¶¶ 20-22 (Aug. 5, 2008), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-178A1.pdf; Memorandum Opinion and Order, *In re Applications of Comcast Corporation, General Electric Company and NBC Universal, Inc. For Consent to Assign Licenses and Transfer Control of Licenses*, FCC 11-4, MB Docket No. 10-56 ¶ 20 (Jan. 20, 2011), *available at* http://transition.fcc.gov/FCC-11-4.pdf; Order, *In re Applications of AT&T Inc. and Deutsche Telkom AG For Consent to Assign or Transfer Control of Licenses and Authorizations*, DA 11-711, WT Docket No. 11-65 ¶¶ 1-2 (Nov. 29, 2011), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-11-711A1.pdf; Memorandum Opinion and Order, *In re Applications of Cellco Partnership d/b/a Verizon Wireless and SpectrumCo LLC and Cox TMI, LLC For Consent to Assign AWS-1 Licenses, Applications of Verizon Wireless and Leap for Consent to Exchange Lower 700 MHz, AWS-1, and PCS Licenses, Applications of T-Mobile License LLC and Cellco Partnership d/b/a Verizon Wireless for Consent to Assign Licenses*, FCC 12-95, WT Docket Nos. 12-4, 12-175 ¶¶ 20, 26 (Aug. 23, 2012), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-12-95A1.pdf.

[36] The merger of T-Mobile and MetroPCS, for example, and the imminent acquisition of Sprint by Softbank undermine many of the assumptions built into the FCC's analysis of recent license transfers, reports, and rulemakings.

commitments from the parties. These conditions are often imposed for periods much longer than the agency could reasonably anticipate potential consumer harms--for seven years or even longer.

Worse, many of the conditions, as well as voluntary commitments imposed on the parties, are wildly unrelated to the transaction or even to a permissible policy objective. For Comcast-NBC Universal, the conditions ran to nearly thirty pages, including a requirement that Comcast adhere to a sui generis version of net neutrality regulations that conflicts with the agency's subsequent rulemaking; rate regulation on Comcast's broadband service; and specific requirements on which channels Comcast offers in its cable packages. Some even defined specific commercials the company would need to run, and on which channels.[37]

In effect, the agency now uses transaction reviews to impose the kinds of regulations that would otherwise require a formal rulemaking, and then compounds that error by applying specific versions of such rules just to the parties involved in a particular license transfer. In many cases, these conditions unfairly manipulate the competitive landscape, applying unrelated restrictions on some parties simply because they happen to be in need of FCC permission to complete a license transfer. Often, the conditions impose rules the agency would be prohibited from enacting through the formal process, either because they exceed the agency's statutory authority or because they run afoul of clearly-established Constitutional constraints.

Besides veering wildly outside the substantive limits on the agency's jurisdiction delegated by Congress, this regulation-by-license-condition process also dispenses with formal procedural requirements, notably notice-and-comment. And because they take the form of orders negotiated by the affected parties, these pseudo-rulemakings, while enforceable by the Commission, are effectively unreviewable by courts.

The net result is a regulatory crazy quilt, where different rules apply to different companies at different times, often in different local markets. The complexity needlessly impedes subsequent transactions, effectively compounding the harm of unstructured reviews in future reviews. Consumers, at the same time, can't be expected to understand why different rules apply to different products and services. The lack of effective process is chilling the investment climate for companies throughout the broadband ecosystem, in direct contradiction to Congress's clear intent.

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[37] "C-NBCU shall provide public service announcements ("PSAs") with a value of $15 million each year on digital literacy, parental controls, FDA nutritional guidelines and childhood obesity. The PSAs on digital literacy, parental controls and FDA nutritional guidelines shall run on networks or programming that have a higher concentration than the median cable network (viewers-per-viewing-household) of adults 25-54 with children under 18 in the household. For the PSAs on childhood obesity, C-NBCU shall air one PSA during each hour of NBC's 'core' educational and informational programming, as defined by 47 C.F.R. § 73.671, on the broadcast stations' primary channels, and an average of two PSAs per day shall run on PBS KIDS Sprout. This Condition shall remain in place for five years." Memorandum Opinion and Order and Report and Order, *In the Matter of Applications of Comcast Corporation, General Electric Company and NBC Universal, Inc. For Consent to Assign Licenses and Transfer Control of Licensees*, FCC 11-4, MB Docket No. 10-56, p. 139 § XIII(6) (Jan. 20, 2011) *available at http://transition.fcc.gov/FCC-11-4.pdf*.

HHIs and the Spectrum Screen: Masking a Lack of Process

Regulation-by-license-condition imposes far more harms on consumers than the often theoretical issues such conditions purport to remedy. The FCC can do much better. And it must. Just as the closing of the real frontier in 1890 required reform of land use and transfer policies, so too does the spectrum crunch require new approaches to transaction review and approval.

As a starting point, the FCC should be required to formalize its review process. This includes applying consistent, transaction-neutral cost-benefit analysis to both the review of a proposed transaction's impact on consumers and of any remedies being considered to offset cognizable harms. The FCC should take into consideration its own data on market dynamics, and weigh heavily the very likely potential that technology-driven forms of competition will more effectively and efficiently resolve the kinds of problems the long lists of unrelated conditions seem intended to forestall.

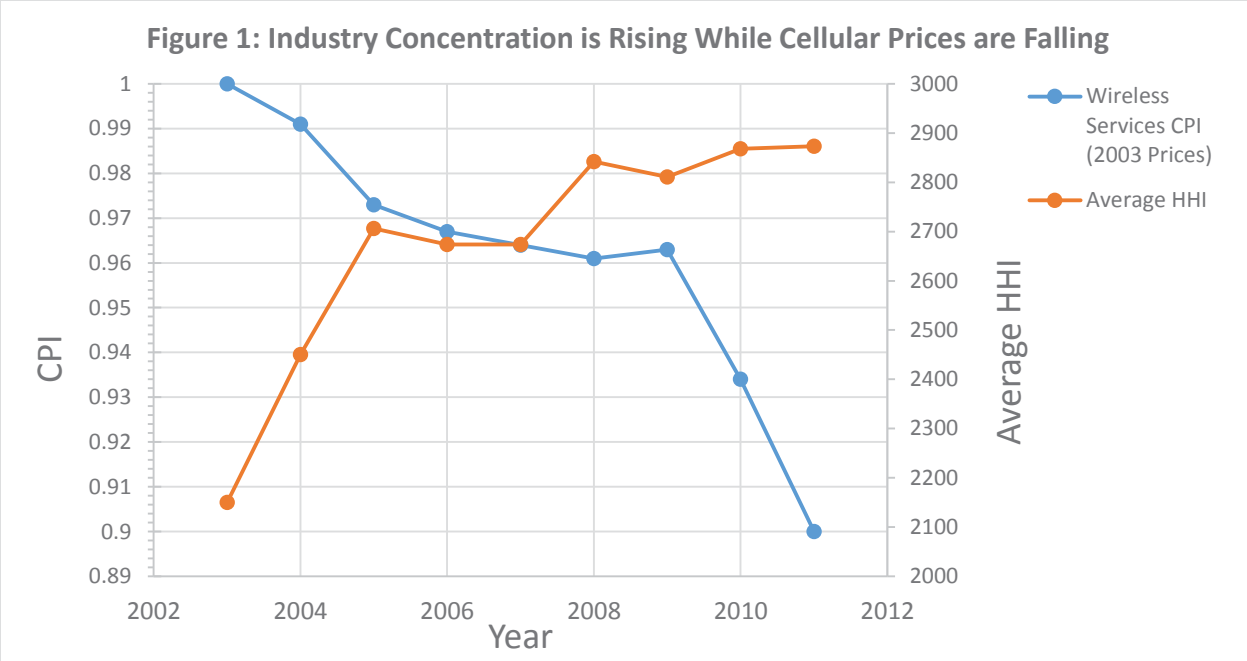
Under the FCC's current unstructured "public interest" review, the agency has backed itself into a crabbed and dismal view of the mobile marketplace, more 19th century than 21st century. It reviews each transaction as if mobile technologies were stagnant, demand were flat, and the only competitive pressure on licensees comes from other "national carriers." The FCC gives no consideration to the vital role played by nearly a dozen distinct forms of technology-driven market discipline (described below) that the agency dutifully catalogs and tracks in its reports.

Today, the absence of basic technological or economic rigor in transaction reviews is masked by page after page of detailed data analysis that is then ignored. The FCC then obscures this failure with the misapplication of obsolete and inapplicable pseudo-measures of market concentration, notably the Herfindahl-Hirschman Index (HHI) and the so-called "spectrum screen."

The HHI, a 1940's era calculation that estimates the level of concentration in a given industry, mechanistically sums the squares of market share for each direct competitor in whatever the agency decides is a relevant local market. The FCC then assumes without evidence that arbitrary numerical ranges predict "concentrated" or "highly concentrated" conditions that would result from a merger.

The agency next takes a dangerous leap of faith, assuming that such concentration is likely to lead to anti-competitive behavior the market would not correct on its own, and that such behavior would result in higher prices and other consumer harms.

Yet measured simply by HHIs, the overall mobile industry has been "highly concentrated" since 2005, at levels the FCC has recently said, without any evidence, trigger a "presumption" of "harm to competition."



Source: HHI from 16th Wireless Report Table 14; Wireless CPI from 16th Wireless Report Table 37.
Notes: Population-weighted average HHI of 172 Economic Areas as computed by the Commission. Cellular CPI is denominated in 2003 prices.

As every consumer knows, the untortured data tell a very different story. Despite those levels of concentration, prices for voice, text, and data have continued to plummet. (See Figure 1)[38]

The HHI calculation, in any event, is of no value. As the FCC explains in all of its reports, competition in the mobile ecosystem is much more complex and sophisticated than simplistic market concentration might infer, affected in critical ways by a wide range of factors beyond the customer base or spectrum holdings of direct competitors. According to the FCC's most recent Mobile Competition reports,[39] for example, these include:

1. **Regional and local competitors** – Despite the FCC's focus on national market share, most consumers choose their carrier based on local alternatives; they don't buy based on the strength of nationwide coverage. At the local level, 90% of U.S. consumers can choose from five or more carriers for voice; 80% have three or more choices for mobile broadband.

[38] *See also* Gerald R. Faulhaber, Rober W. Hahn & Hal J. Singer, *Assessing Competition in U.S. Wireless Markets: Review of the FCC's Competition Reports* (July 11, 2011), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1880964.

[39] *See* 16th Annual Mobile Competition Report, *supra* note 7. *See also* Annual Report and Analysis of Competitive Market Conditions with Respect to Mobile Wireless, Including Commercial Mobile Services, Fifteenth Report (June 27, 2012), http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-11-103A1.pdf.

2. **Device manufacturers** – The availability of particular tablets and smartphones on a network plays a significant role in which carrier a consumer chooses. From 2008-2009, for example, 38 percent of those who switched carriers did so because it was the only way to obtain the particular handset that they wanted. If anyone has market power, it is the device manufacturers—and that power rises and falls with each new model and the changing market share of different operating systems and app stores.

3. **Operating system developers** – Consumer decision-making is also highly influenced by the availability of a particular operating system (iOS, Android). Android captured 20% of the mobile O/S market in the first six months, giving Google considerable leverage in the market overall.

4. **Apps** – Consumers also make choices based on the availability of preferred apps, including music, video, geolocation, and social networking services. The most popular activity by far for today's smartphone users is games, some of which are only available on some devices or operating systems.

5. **Enhanced spectrum** – Technology has continued to make more bands of spectrum usable for more types of communications. Clearwire now offers mobile broadband using spectrum in the >1 GHz range; Dish Networks has proposed the use of satellite spectrum to offer 4G service. And the LTE protocol is dramatically more efficient in its use of spectrum than earlier generations.

6. **Available spectrum and cell tower infrastructure** – Carriers continue to invest billions every year in enhanced infrastructure. But the quality of service network operators can provide is still highly constrained by the lack of available spectrum. At the local level, delays and even corruption in approving applications to add towers or antennas makes it difficult for network operators to make the best use of the limited spectrum they have. At the end of 2009, over 3,000 applications to add or modify cell towers and antennae had been pending for over a year; many for over three years.

7. **Off-the-charts demand for capacity** – Carriers are also pressured by incredible increases in demand for mobile broadband. Since the introduction of the iPhone in 2007, AT&T reported an increase of over 8,000% in data traffic.

8. **No-contract carriers** – As capacity constraints push contract carriers to curtail unlimited data plans, competition from no-contract or "pre-paid" providers has intensified. The distinction between pre- and post-paid networks is increasingly meaningless, yet the FCC gives little to no weight to the discipline such providers exert in reviewing transactions...

9. **Inter-modal competition with wired networks** – By 2010, 25% of all U.S. households relied exclusively on mobile connections for home voice service ("cutting the cord."). As high-speed, high-capacity LTE networks (and whatever comes after LTE) are deployed, mobile carriers will increasingly compete with wired carriers for the same customers, including traditional phone and cable companies. The pool of competitors is expanding, not contracting.

Thanks to these varied forms of market discipline, even a mobile ecosystem that is "highly concentrated," at least as measured by HHIs, doesn't seem to have harmed consumers. To the contrary. As every measure of market performance collected by the FCC makes clear, the broadband ecosystem is providing consumers with a phenomenal range of new products and services, at the most competitive prices of any industry.

That's because there are plenty of other sources of competition in the market beyond direct competitors, sources well documented by the FCC itself. Put more simply, concentration measured by HHI concentration has become a worthless tool in evaluating mobile competition.

Backing up the HHI analysis is the voodoo of the spectrum screen, a remarkably elastic and utterly unscientific tool that purports to test the competitive impact in local markets of proposed license transfers.

The spectrum screen was introduced to simplify the review of license transfers,[40] but in recent reviews it has morphed into a presumption of harm in markets where the screen is exceeded.

In either case, the spectrum screen is a poor proxy for several reasons. It includes only some frequencies licensed for mobile services and leaves out others more or less randomly, often modifying that list in different markets — as if radio technology worked differently in California than it does in Virginia.

Worse, the screen treats all the included frequencies as if each band, whether above or below 1 GHz, whether complementary or not to the parties existing holdings or those of its competitors, were of identical value to each network operator. The FCC's own data collection amply reveals the technical and economic fallacy of such a gross simplification.

The screen is also modified from transaction to transaction on an *ad hoc* basis, based on no established or even articulated criteria, leaving the strong impression that the adjustments are made simply to get the numbers to come out the way a majority of the Commissioners wants them to come out, for reasons that can only be guessed. Even the appearance of post hoc rationalization undermines the integrity of the FCC's transaction reviews.

[40] Applications of AT&T Wireless Services, Inc. and Cingular Wireless Corporation For Consent to Transfer Control of Licenses and Authorizations, WT Docket No. 04-70, Memorandum Opinion and Order, 19 FCC Rcd 21522, 21552 ¶¶ 58, 106-112 (2004), http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-255A1.pdf.

The spectrum screen's failings as an analytic tool are legion. Since its invention, it has never been the subject of any formalization subject to notice-and-comment; the screen simply lumbers, like Frankenstein's monster, from one transaction review to the next. To its credit, the FCC recently issued a Notice of Proposed Rulemaking aimed at making some sense of it, or perhaps to put it to a much-needed demise.[41] But the Commission's true intentions are unclear. As Commissioner Pai pointed out, the NPRM did not, in fact, propose any rules.[42]

There is, in fact, no sense to be made of the screen, beyond its stated purpose to quickly eliminate those local markets that clearly require no competitive review. All that can be said in support of the screen as a measure of harm, on the other hand, is that it is marginally less arbitrary and open to manipulation than the previous *per se* spectrum cap, which, incredibly, the Commission is now considering reinstating.

A Modest Proposal for Reform

Against these dangerous pseudo-analytic tools, the proposed FCC Process Reform Act proposes several common-sense reforms. None of them should be the least bit controversial.

They would mandate such obvious improvements as requiring the FCC to identify actual consumer harms before regulating to correct them; to conduct realistic economic analysis; to subject proposed remedies to neutral cost-benefit analysis; to consider more effective alternatives; and to evaluate the performance of rules after they have been put into effect.

That minimal level of analytic rigor has long been mandatory for Executive agencies. As if such confirmation were necessary, in 2011, President Obama made clear that he expected (though could not require) the same basic tools be applied as a matter of course by independent regulatory agencies including the FCC.[43]

The proposed FCC Process Reform Act goes farther in the direction of common sense. The bill would codify informal shot clocks that today fail to impose needed deadlines on agency action. It would require, sensibly, that a Notice of Proposed Rulemaking be preceded by a Notice of Inquiry. This would ensure the agency has first established the need for rules before proposing them.

For rules and amendments that may have a significant economic impact, the proposed bill would require the agency to identify specific market failures, actual consumer harm, the burden of existing regulation and a "reasoned determination that the benefits of the adopted rule or amendment justify its costs,"

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[41] *In the Matter of Policies Regarding Mobile Spectrum Holdings*, WT Docket No. 12-269, Notice of Proposed Rulemaking (Sept. 28, 2012), http://www.fcc.gov/document/mobile-spectrum-holdings-nprm.

[42] Concurring Statement of Commissioner Ajit Pai, *In re Policies Regarding Mobile Spectrum Holdings*, WT Docket No. 12-269, at 49 (Sept. 28, 2012) ("[T]oday's Notice of Proposed Rulemaking contains no notice of proposed rules."), http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-12-119A1.pdf#page=49.

[43] Exec. Order No. 13,579, 76 Fed. Reg. 70913 (July 11, 2011), *available at* http://www.whitehouse.gov/the-press-office/2011/07/11/executive-order-regulation-and-independent-regulatory-agencies.

taking into account alternative forms of regulation. In deference to the realities of markets involving digital technology, it also sensibly requires that the agency consider the possibility that "market forces or changes in technology are unlikely to resolve within a reasonable amount of time the specific market failure" or actual consumer harm.

For the increasingly urgent problem of unstructured transaction review, the proposed FCC Process Reform Act would require the agency to tailor attached approval conditions to those that remedy actual harms to consumers that result from the proposed license transfer, and limit those remedies to those within the statutory powers of the FCC when it acts outside the review process. It erases the fiction that "voluntary" commitments are anything of the kind, requiring likewise that such commitments be limited to remedies already within the agency's statutory and Constitutional boundaries.

Together, these reforms would greatly improve the transparency and consistency of the FCC's processes and impose realistic deadlines on agency decision-making, reducing the potential for a meandering review or rulemaking to take dangerous turns.

In effect, these modest process improvements replace the free-ranging and often-opaque decision making processes of today's FCC with the reasonable and uncontroversial tool of cost-benefit analysis. Ensuring that the costs of regulation do not exceed their benefits, and requiring agencies to consider alternative rules that could address the same harms more efficiently, has been a goal of "good government" reform for decades. It is an entirely bi-partisan goal.

Indeed, it is a goal shared by the current Administration. In a 2011 Executive Order, President Obama imposed precisely the same rigor on executive agencies.[44] Echoing the proposed FCC Process Reform Act, the Executive Order requires executive agencies to:

> (1) propose or adopt a regulation only upon a reasoned determination that its benefits justify its costs (recognizing that some benefits and costs are difficult to quantify); (2) tailor its regulations to impose the least burden on society, consistent with obtaining regulatory objectives, taking into account, among other things, and to the extent practicable, the costs of cumulative regulations; (3) select, in choosing among alternative regulatory approaches, those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity); (4) to the extent feasible, specify performance objectives, rather than specifying the behavior or manner of compliance that regulated entities must adopt; and (5) identify and assess available alternatives to direct regulation, including providing

[44] Exec. Order No. 13,563, 76 Fed. Reg. 3821 (Jan. 18, 2011), *available at* http://www.whitehouse.gov/the-press-office/2011/01/18/improving-regulation-and-regulatory-review-executive-order.

> economic incentives to encourage the desired behavior, such as user fees or marketable permits, or providing information upon which choices can be made by the public.[45]

The Executive Order, likewise, requires departments and executive agencies to operate with the same level of transparency called for in the proposed FCC Process Reform Act. Specifically, the order called for agencies:

> to provide the public with an opportunity to participate in the regulatory process. To the extent feasible and permitted by law, each agency shall afford the public a meaningful opportunity to comment through the Internet on any proposed regulation, with a comment period that should generally be at least 60 days. To the extent feasible and permitted by law, each agency shall also provide, for both proposed and final rules, timely online access to the rulemaking docket on regulations.gov, including relevant scientific and technical findings, in an open format that can be easily searched and downloaded. For proposed rules, such access shall include, to the extent feasible and permitted by law, an opportunity for public comment on all pertinent parts of the rulemaking docket, including relevant scientific and technical findings.[46]

There is no relevant reason these common-sense requirements should not apply to independent regulatory agencies such as the FCC, which the President made clear in a subsequent Executive Order extending earlier Orders to independent regulatory agencies, "to the extent permitted by law"[47]

Indeed, given the increasingly significant economic impact of FCC decisions affecting the broadband ecosystem, these reforms are even more urgently needed to meet what the President defined as the goal of cost-benefit analysis: not to neuter regulatory agencies or deny them flexibility but to "protect public health, welfare, safety, and our environment while promoting economic growth, innovation, competitiveness, and job creation."[48]

The FCC's expert staff stands ready, willing and able to help the Commission make reasoned, timely decisions based on simple, economically sound principles that are grounded in real data. The agency already has the capacity to operate transparently, involving the public and explaining itself coherently to consumers. But it must be weaned from the inconsistent and dangerous practice of confounding markets with unwise and irrelevant rulemakings, amendments, orders and auction and transaction conditions.

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[45] *Id.*
[46] *Id.*
[47] *See* Exec. Order No. 13,579, *supra* note 43.
[48] *See* Exec. Order No. 13,563, *supra* note 44. Congress has already mandated such analysis for regulations that affect small businesses, a requirement largely irrelevant to FCC actions. *See* Curtis W. Copeland, *Economic Analysis and Independent Regulatory Agencies* (April 30, 2013), *available at* http://www.acus.gov/sites/default/files/documents/Copeland%20Final%20BCA%20Report%204-30-13.pdf.

The FCC, as noted, already collects precisely the kind of data it needs to perform meaningful analysis, yet time after time the agency steps back from the brink just before reaching a reasoned decision. Replacing the unstructured processes that have developed in recent decades with the kind of rigorous tools called for in both the President's Executive Order and the proposed FCC Process Reform Act would take the FCC far along the road toward the 21st Century, where we urgently need it to be.

Big Bang Disruption and Regulatory Humility

At a minimum, the FCC should be required to justify its interventions in the market the same level of analytical rigor that Presidents of both parties have long demanded of Executive Agencies. But if anything, the FCC needs to exercise more caution than other agencies. That is because its authority is entirely within zones of economic activity undergoing persistent, dramatic and accelerating technological disruption.

I have recently completed a multi-year research project, in collaboration with Paul F. Nunes, Global Managing Director of the Accenture Institute for High Performance. Our study focused on the changing nature of economic transformation in response to technologies, such as those at the core of the computing and communications sectors, that continue to become both better and cheaper at the same time over long periods of time. We refer to such "disruptors," which include commodities such as computer processors, storage, and data transit, as "exponential technologies."

My co-author and I reported our initial results in a recent cover story for the ***Harvard Business Review,*** which I have included as an Appendix.[49]

Our principal finding is that over the last decade, the pace and the intensity of disruption has increased in every industry, particularly in those whose core products and services are built on exponential technologies. These industries are now experiencing what we refer to as "Big Bang Disruption," where new products and services can emerge overnight from the primordial ooze of direct market experimentation and the combination of off-the-shelf components readily connected to each other at profoundly reduced research and development costs.

These disruptors are unique in economic history in that they emerge both better and cheaper than established products and technologies. In a matter of days or weeks, as a result, consumers can abandon the old for the new, leaving incumbent providers little time or opportunity to respond. The result is often the decimation of long-standing industry supply chains, a sudden and violent version of what economist Joseph Schumpeter famously characterized as the "perennial gale of creative destruction" of modern capitalist economies.[50]

The smartphone alone has already spawned many such disruptors. Consider just a partial list of the products and services already or soon-to-be retired by mobile devices, including: address books, video cameras, pagers, wristwatches, maps, books, travel games, flashlights, home telephones, Dictaphones,

[49] Larry Downes and Paul F. Nunes, *Big Bang Disruption*, HARVARD BUSINESS REVIEW 44 (March 2013).
[50] Joseph A. Schumpeter, CAPITALISM, SOCIALISM, AND DEMOCRACY (Harper 3d ed. 2008) (1942).

cash registers, Walkmen, day timers, alarm clocks, answering machines, yellow pages, wallets, keys, phrase books, transistor radios, personal digital assistants, dashboard navigation systems, remote controls, newspapers and magazines, directory assistance, travel and insurance agents, restaurant guides and pocket calculators— just to name a few.

This accelerating pace of industry change, I believe, has profound implications for the regulatory process, particularly for agencies operating at the center of the perennial gale. For one thing, the deliberative pace of regulation increasingly means that by the time rules are made, transactions are reviewed, or practices scrutinized for violations, consumers, markets, and providers have long since moved on. Dynamic technology-driven markets, in other words, increasingly remedy their own harms, more quickly and far more efficiently than regulators can.

At the same time, it is simply impossible even for those of us in Silicon Valley and other technology hubs to predict how exponential technologies will evolve and the kinds of markets they will both create and destroy. The FCC must be cured of an institutional hubris that suggests otherwise. The agency's rules, amendments, orders, auction designs and transaction conditions reflect a profoundly dangerous belief that, despite being disconnected from the messy realities of Big Bang industries, the agency can nonetheless predict the future and head off consumer harms that haven't yet occurred.

But the Commission cannot predict the future, even in the short term. No one can. Most of us in the technology sectors have stopped trying. So in addition to replacing the agency's non-processes with the rigor and consistency of basic cost-benefit analysis, I urge both the FCC and Congress to introduce, as part of that analysis, a healthy dose of technological humility—a recognition that the costs of regulators getting it wrong often outweigh the costs of not intervening.[51]

This takes the form of the additional requirement, explicit in the modest process reforms already proposed for rulemakings, that in transaction reviews, auction designs, orders and amendments, the FCC must seriously consider the potential for emerging technologies to resolve existing or theoretical consumer harms without the need for intervention.

The FCC should, as proposed in the draft bill, be required to adopt the sensible requirement that it consider the balance of both the costs and benefits of proposed rules, amendments, orders, auction designs and transaction conditions, as well as considering alternative remedies that would solve demonstrated consumer harms more efficiently.

[51] Geoffrey A. Manne & Joshua D. Wright, *Innovation and the Limits of Antitrust*, George Mason Law & Economics Research Paper No. 09-54 (Oct. 27, 2012) ("It is because of these dynamic and often largely unanticipated consequences of novel technological innovation that both the likelihood and social cost of erroneous interventions against innovation are increased."), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1490849.

But before taking action, the agency should ***also*** be required to make a reasoned determination that the specific market failure identified will not otherwise be corrected without regulatory intervention. The FCC should be require to demonstrate, in other words, that market forces driven by technological disruptors would not otherwise remedy specific consumer harms within a reasonable period of time absent the proposed rule, amendment, order or condition.

Notably, this was precisely the approach taken by the Department of Justice, for example, in its separate review of the Sirius/XM merger. In its four-page statement closing its in 2008, the Antitrust Division easily concluded that transaction was "not likely to harm consumers." Even though the two parties represented the entire satellite radio market, the Division sensibly found that new forms of competition driven by emerging digital technologies would be more than adequate to discipline the merged entity:

> Any inference of a competitive concern was further limited by the fact that a number of technology platforms are under development that are likely to offer new or improved alternatives to satellite radio. Most notable is the expected introduction within several years of next-generation wireless networks capable of streaming Internet radio to mobile devices. While it is difficult to predict which of these alternatives will be successful and the precise timing of their availability as an attractive alternative, a significant number of consumers in the future are likely to consider one or more of these platforms as an attractive alternative to satellite radio. The likely evolution of technology played an important role in the Division's assessment of competitive effects in the longer term because, for example, consumers are likely to have access to new alternatives, including mobile broadband Internet devices, by the time the current long-term contracts between the parties and car manufacturers expire.[52]

It took the FCC seventeen months and a hundred-plus page order to reach the same conclusion.[53] And despite the fact that the parties controlled only 5% of the overall audio market at the time of the merger, the FCC's eventual order was, as Commissioner McDowell noted at the time, "one of the most heavily conditioned in FCC history."[54]

Needless to say, the emergence of even more forms of disruptive digital technologies for audio content than the Antitrust Division expected have already arrived, and sooner. Consumers have more choices for

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[52] Statement of the Department of Justice Antitrust Division on its Decision to Close its Investigation of XM Satellite Radio Holdings Inc.'s Merger with Sirius Satellite Radio Inc., Department of Justice (Mar. 24, 2008), http://www.justice.gov/opa/pr/2008/March/08_at_226.html.

[53] Federal Communications Commission Memorandum Opinion and Order and Report and Order, *In re Applications for Consent to the Transfer of Control of Licenses, XM Satellite Radio Holdings Inc., Transferor, To Sirius Satellite Radio Inc., Transferee,* MB Docket No. 07-57 (Aug. 5, 2008), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-178A1.pdf.

[54] Statement of Commissioner Robert M. McDowell, *In re Applications for Consent to the Transfer of Control of Licenses, XM Satellite Radio Holdings Inc., Transferor, to Sirius Satellite Radio Inc., Transferee*, MB Docket No. 07-57, p. 109 (Aug. 5, 2008), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-178A1.pdf.

audio content than ever, including many from providers who did not exist at the time of the Sirius/XM merger.

As this example highlights, the market discipline of exponential technologies is an especially relevant criteria for the FCC to consider, particularly in designing imposed or voluntary transaction conditions and in the design of future spectrum auctions.

And since such conditions apply only to the parties in a proposed auction or license transfer, the agency should also be required to provide evidence that both the harm and the proposed remedy are entirely contained within the proposed license transfer.

If the behavior of other industry parties also contribute to the identified consumer harm, the agency should not wait for future transactions involving those parties to address the problem. If, independent of a proposed transaction, there is a genuine consumer harm that is not likely to be corrected by technological disruptors, the FCC should simply issue a Notice of Inquiry and, if warranted, a Notice of Proposed Rulemaking.

Rather than use transaction reviews as piecemeal rulemakings, in other words, the agency should be required, when non-parties are also partly or wholly the cause of the demonstrated harm, to propose its remedy as a rulemaking. In addition to reducing the incidence of inconsistent rules applied to different parties in different markets at different times, this would also ensure that such rules, when they are truly needed, are subjected to both the notice-and-comment process and the possibility of judicial review. Neither is possible when rulemakings are embedded in auction designs and transaction conditions.

Conclusion

I began these comments with reference to Ronald Coase, who turned 102 last year. Coase's work is in fact at the core of all of my recommendations. He is the father of the now conventional wisdom that regulations impose costs, and he was first to propose that such costs should be weighed against their benefits and compared to the costs of alternative remedies, including market-based solutions midwifed by new technological innovation.[55]

And it was Coase who first recognized the value and fungibility of spectrum, proposing the very idea of auctioning frequencies, and to look to the market, rather than the FCC, both to resolve technical problems of interference and to ensure that available bands were put to their best and highest use.[56]

But I want to conclude with the wisdom of another sage, who said of the best ways to improve FCC process:

[55] Ronald Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 43 (1959).
[56] Ronald Coase, *The Federal Communications Commission*, 2 J.L. & ECON. 9 (1959).

> The FCC is currently structured along the traditional technology lines of wire, wireless, satellite, broadcast, and cable communications. As the lines between these industries merge and blur as a result of technological convergence and the removal of artificial barriers to entry, the FCC needs to reorganize itself in a way that recognizes these changes and prepares for the future. A reorganization of the agency along functional rather than technology lines will put the FCC in a better position to carry out its core responsibilities more productively and efficiently.[57]

The author of that recommendation is former FCC Chairman William Kennard, whose prescient 1999 "Strategic Plan" for the agency still stands as a brilliant and largely unfulfilled vision for a 21st century Commission. The Plan foresaw much of the convergence in technologies and industries that have since unfolded. In advance of the information revolution, the Plan proposed a new structure for the FCC that could, if implemented, still greatly improve its efficiency and, in particular, the Commission's ability to manage spectrum, promote competition, and encourage consumer adoption across all demographic boundaries — in short, to fulfill the agency's core mission.

By eliminating obsolete reporting requirements for the agency and consolidating the remaining reports into a single bi-annual schedule, the proposed Consolidated Reporting Act would take us at least one step in the direction Kennard proposed almost fifteen years ago.

In addition to simplifying the reporting process and saving wasted taxpayer dollars by producing multiple overlapping reports, consolidating to a single report will encourage the FCC to recognize explicitly what is obvious to all consumers: the convergence of many if not all of the communications technologies the agency oversees, and the growing interdependence and inter-modal competition within the Internet ecosystem, where content, communications, and computing have mingled in ways that produce profound new value for consumers.

Consolidated reporting would force the FCC's bureaus to tear down the walls that anachronistically divide them today, imposing the kind of methodological rigor that, as I have said, the agency desperately needs across its activities.

[57] FCC, STRATEGIC PLAN: A NEW FCC FOR THE 21ST CENTURY (1999), http:// transition.fcc.gov/2 1st century/draft-strategicplan.pdf.

Appendix VI

Hearing on "State of Wireline Communications"

Before the Subcommittee on Communications, Technology and the Internet
Committee on Commerce, Science and Transportation

U.S. Senate

Written Testimony of Larry Downes[58]
Internet Industry Analyst and Author

July 25, 2013

Chairman Pryor, Ranking Member Wicker and members of the Subcommittee, thank you for this opportunity to testify on the state of wireline communications.

My name is Larry Downes. Based in Silicon Valley, I am an Internet industry analyst and the author of several books on the information economy, innovation, and the impact of regulation. I have also written extensively on the effect of communications regulation on the dynamic broadband ecosystem, and in particular the role played by the FCC and local regulators.

Summary

Wireline communication is in the midst of its most profound technological transformation in over a century of evolution. The old public-switched telephone network (PSTN) is joining other obsolete networking technologies in converting to the packet-switched network protocols of the Internet (IP). Analog equipment is being replaced with digital; copper is being replaced or supplemented with fiber optic cable. Voice, video and data are converging onto a single standard, and moving over a single global network infrastructure.

The emerging communications ecosystem, which includes broadband networks using fiber, cable, satellite and mobile technologies, is exponentially more efficient, extendable, and powerful than the separate, aging networks it is replacing. It offers new services that were unimaginable just a few years ago, and promises to accelerate its offerings in the coming decade. It is generating profound economic growth and new competitive advantage for American businesses that are leading the revolution.

[58] Larry Downes is an Internet industry analyst and author. His books include *Unleashing the Killer App* (Harvard Business School Press, 1998), *The Laws of Disruption* (Basic Books, 2009) and *Big Bang Disruption: Strategy in an Age of Devastating Innovation* (Penguin Portfolio, forthcoming 2013).

The nature of wireline communications has changed utterly, and will continue to evolve as our technology industries complete their conversion to Internet standards. Wireline network operators, as the FCC acknowledges, increasingly compete not only with each other but with providers of mobile and other broadband networks, as well as cloud hosting and digital commerce services, content providers, consumer electronics device manufacturers, and operating system and other software developers.[59] Already, American consumers are enjoying the benefits of highly competitive, integrated markets for all manner of communication and information services.

While phone companies once dismissed the Internet as an inferior communications protocol for voice, carriers large and small have now embraced it. As switched network technology matured, IP has zoomed ahead, supporting exploding demands from consumers, small businesses, cloud-based services, and the coming deluge of machine-to-machine communications known as "the Internet of Things." This new ecosystem is emerging organically from the deployment of robust, global broadband IP networks, a dividend from over $1 trillion in private funding invested in IP-based technologies in the first decade of the commercial Internet.[60]

Not surprisingly, the communications industry itself is being affected more profoundly than any other by disruptive technologies. But the transition to an all-IP network follows a pattern in disruptive technological innovation I have been studying for most of my career. In our recent *Harvard Business Review* article, "Big Bang Disruption," my co-author Paul F. Nunes and I reported on research into a new model of technology-based innovation, one that is dramatically remaking every sector of the global economy, and in record time.[61]

This accelerating pace of industry change, I believe, has profound implications for the regulatory process, particularly for agencies operating at the center of what Joseph Schumpeter once called "the perennial gale of creative destruction."[62]

Dynamic, technology-driven markets, for example, increasingly remedy their own harms more quickly and far more efficiently than regulators can. As change accelerates, on the other hand, the deliberative pace of regulation increasingly means that by the time laws are passed and rules are made, consumers, markets, and providers have long since moved on.

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[59] Larry Downes, *FCC Refuses to State the Obvious: Mobile Market is Competitive*, CNET NEWS.COM, April 3, 2013, *available at* http://news.cnet.com/8301-1035_3-57577630-94/fcc-refuses-to-state-the-obvious-mobile-market-is-competitive/.

[60] *See* Reed Hundt & Blair Levin, THE POLITICS OF ABUNDANCE: HOW TECHNOLOGY CAN FIX THE BUDGET, REVIVE THE AMERICAN DREAM, AND ESTABLISH OBAMA'S LEGACY 9 (2012).

[61] Larry Downes & Paul F. Nunes, *Big Bang Disruption*, HARVARD BUSINESS REVIEW, March, 2013, at 44, *available at* http://hbr.org/2013/03/big-bang-disruption/ar/1.

[62] Joseph A. Schumpeter, CAPITALISM, SOCIALISM, AND DEMOCRACY (Harper 3d ed. 2008) (1942).

Under laws that date back nearly a century, regulatory agencies such as the FCC continue to tinker with 21st century problems using a 19th century toolkit. They are encouraged to do so by the siren song of competitors who prefer to lobby than to evolve, and by state and local regulators who fear they will play a far smaller role in the broadband future.

But it is simply impossible even for those of us in Silicon Valley and other technology hubs to anticipate how future technology improvements will evolve and the kinds of markets they will both create and destroy. Government must admit to its institutional hubris. Today's laws and regulatory rules reflect a profoundly dangerous belief that, despite being disconnected from the messy realities of rapid technology change, regulations can nonetheless predict the future and head off consumer harms that haven't yet occurred.

But regulators cannot imagine what is to come, even in the short term. No one can. Instead Silicon Valley investors have refined the art of making small bets on a range of experiments, watching closely to see which ones consumers embrace.

Increasingly, the risks of government getting it wrong outweigh the benefits, if any, of intervention.

I urge this Committee, in its analysis of communications and technology markets and industries, to consider adding a healthy dose of technological humility—of adopting a "watchful waiting" principle for disruptive technologies, and Hippocratic-like oath to "first do no harm." Legislate only when it's clear that there is demonstrable harm to consumers, a remedy that isn't so broad as to cause unintended negative side effects, and no reasonable hope that the next generation of technology will moot the problem before new rules can be crafted.[63]

My testimony addresses the most significant regulatory challenge facing the wireline industry today: the transition to all-IP networks and the accelerated retirement of the obsolete PSTN. I will describe what I see as the most productive role for Congress and the FCC in supporting that transition, and the benefits of universal broadband adoption and economic growth that will result from getting it right. I will also discuss the particular issue of IP-to-IP interconnection, and lessons learned from the flawed but ultimately successful transition, last decade, from analog to digital television.

[63] Larry Downes, *Toward a Technology 'Watchful Waiting' Principle,'* TECHNOLOGY LIBERATION FRONT, Jan. 17, 2013, *available at* http://techliberation.com/2013/01/17/toward-a-technology-watchful-waiting-principle/. *See also* Geoffrey A. Manne & Joshua D. Wright, *Innovation and the Limits of Antitrust*, George Mason Law & Economics Research Paper No. 09-54 (Oct. 27, 2012) ("It is because of these dynamic and often largely unanticipated consequences of novel technological innovation that both the likelihood and social cost of erroneous interventions against innovation are increased."), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1490849.

Accelerating the IP Transition[64]

The IP-based ecosystem reduces economic friction to dramatic effect. In information industries more than anywhere else, entrepreneurs now develop new products and services in real-time. Indeed, early users are increasingly co-developers, participating in product design, financing (through services such as Kickstarter), marketing and even customer service. The result is a new kind of technology disruptor, the "big bang disruptor": one that enters the market as a cheaper, higher-quality, and more customizable substitute for existing products offered by incumbent providers.

In response to the sudden abandonment of older products and services by consumers with easy access to new big bang disruptions, many incumbents fail to adapt, unable to accept the death of the generation of core technologies on which their companies were built.

Challenging much of the conventional wisdom of strategy and competition, my co-author and I argue that incumbents, if they are to survive, must learn to see disruption coming much sooner and react decisively and quickly. Incumbents trained by a generation of strategic planning theory to wait for new markets to mature before beginning the transformation of their core business have waited too long. Many don't survive the transition.

Big Bang Disruption is nowhere more visible than it is in the communications industry itself. It is hard to overestimate the magnitude of the shift taking place in our technology infrastructure. Like many of the industries in our study, the transformation is following a familiar pattern. As disruptive technologies become both better and cheaper, customers abandon older products and services gradually, and then suddenly.

This is especially true for legacy PSTN providers still operating under Title II of the Communications Act.[65] For legacy PSTN providers, pricing, quality, and access to infrastructure by competitors are all regulated on the slower clock speed of government agencies. As their customers migrate to better and cheaper alternatives that are free of such regulations, the added

[64] Some of the comments that follow are derived from Comments filed with the FCC that I filed jointly with TechFreedom and the International Center for Law & Economics. See *How the FCC Can Lead the Way to Internet Everywhere by Enabling the IP Transition*, Reply Comments of Geoffrey A. Manne, Matthew Starr, Berin Szoka and Larry Downes, IN THE MATTER OF THE TECHNOLOGICAL TRANSITION OF THE NATION'S COMMUNICATION'S INFRASTRUCTURE, GN Docket No 12-353, (Filed on Feb. 25, 2013), *available at* http://apps.fcc.gov/ecfs/document/view?id=7022125022.
[65] Communications Act of 1934, 47 USC § 151 et. seq. (1934).

gravitational pressure on the incumbents, who must continue to operate as common carriers, becomes unbearable.

PSTN providers can't beat better and cheaper with worse and more expensive, especially when worse and more expensive has to stay that way as a matter of law.

They must move faster. Customers are abandoning wired telephone service in favor of fiber and cable-based Voice over IP (VoIP) and mobile broadband at a remarkable rate. At its peak, the PSTN network connected nearly every American. By the end of 2011, less than half of all American homes still had a wired connection. That number could fall to as little as 25% by 2015.[66]

The disruptor here, of course, is networking technology that operates natively using the packet-switching protocols of the Internet. IP networks, crucially, don't care if the packets contain voice, data, or video content. While phone companies once dismissed IP as unsuitable for voice communications, carriers large and small have now embraced IP as the only option to satisfy exploding demand of consumers, cloud-based services, and the coming data deluge of machine-to-machine communications known as "the Internet of Things."

That superior design has created an enormous black hole for PSTN network operators. As fewer customers subscribe to wireline services, the cost of maintaining aging copper and analog switches is increasing dramatically, both in absolute terms and on a per-customer basis. As much as 50% of current wireline expenditures go toward maintenance. By comparison, the operating expenses of native IP networks can be as much as 90 percent less than for PSTN.[67]

To their credit, the incumbent providers are trying to retire and replace what had been, until recently, their most valuable assets. Both Verizon and AT&T have spent billions accelerating the replacement of copper with fiber, and circuit-switched with packet-switched equipment.

But turning off the old network isn't as simple as it sounds. By law, carriers cannot retire the switched network without federal and perhaps state regulatory approval, even if superior alternatives are in place. And the FCC and state regulators have balked at giving permission for

[66]Larry Downes, Larry Downes, *Telcos Race Toward an all-IP Future*, CNET NEWS.COM, Jan 8, 2013, *available at* http://ces.cnet.com/8301-34435_1-57562644/telcos-race-toward-an-all-ip-future/.
[67]Id. *See also* Larry Downes, *AT&T Moves Dramatically Towards 'Internet Everywhere,'* FORBES, Nov. 8, 2012, *available at* http://www.forbes.com/sites/larrydownes/2012/11/08/att-moves-dramatically-towards-internet-everywhere/.

the switchover, calling for more study on proposed trials for PSTN to IP switchovers in test markets.[68]

The longer the carriers are required to spend money maintaining the obsolete networks, however, the less capital budget is available to accelerate the replacement of aging and obsolete equipment with better and cheaper IP technologies, including fiber optics, digital switches, and upgrades to straining cellular networks.

In the end, the real victims of the regulatory logjam are the remaining wireline customers who are also, not surprisingly, the ones least likely to be benefiting from Internet services. The customer segments that are farthest behind in broadband adoption, according to FCC data, are those most likely to be relying on switched telephone networks as their only form of communication access.[69] These include rural users, seniors, and low-income customers.

Getting these communities onto IP networks sooner rather than later eliminates the need for expensive duplication of the obsolete switched infrastructure. It will also make it easier and less expensive for them to connect to other broadband services including video and Internet access.

In that sense, allowing the carriers to accelerate the transition to IP would overcome many of the obstacles that keep 20 percent of American adults from joining the Internet. According to the Pew Internet Project, almost half of that group cite as their primary reason not to connect a lack of relevance to their needs, rather than cost.[70] With IP-based telephony in place, however, the relevance for employment, education, health care, family life, entertainment and commerce would be far easier to communicate.

For Congress and the FCC, this is the moment of truth. The IP Transition is gaining speed, and its ultimate completion is inevitable. But even inevitable advances in technological progress can be delayed significantly by over-regulation, denying some consumers the full benefits of the Internet ecosystem.

The FCC has an unavoidable role to play in the process. As communications markets are being simultaneously destroyed and recreated, regulations designed to dull the sharper edges of once-

[68] Larry Downes, *FCC Again Balks on Telephone Network Shutdown*, CNET NEWS.COM, May 14, 2013, *available at* http://news.cnet.com/8301-1023_3-57584306-93/fcc-again-balks-on-telephone-network-shutdown/.
[69] FCC, *Eighth Broadband Progress Report*, GN Docket 11-121 (Aug 21, 2012), ¶ 122 at p. 54, *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-12-90A1.pdf.
[70] Pew Internet and American Life Project, *Digital Differences*, April 13, 2012, *available at* *http://pewinternet.org/Reports/2012/Digital-differences/Main-Report/Internet-adoption-over-time.aspx*.

static and siloed technologies are now, as the agency recognizes, posing the very real danger of unintentionally holding back the progress of innovation. The agency must unravel itself from its complicated relationships with the affected industries, and quickly.

To begin with, the FCC should expeditiously grant pending petitions for trials to switchover PSTN networks to native IP. And, while the trials are underway, the FCC should use begin planning a pro-transition agenda that can be enacted swiftly upon successful completion of the trials—or modified as necessary to adjust for any lessons learned.

Specifically, Congress and the FCC should:

1. Clearly define the IP Transition as a central Federal policy objective and make clear its intentions that VoIP be left unregulated.

2. The FCC should preempt state regulators' efforts to preserve PSTN networks beyond their useful lives to the long-term detriment of ratepayers.

3. Plan and set a date certain for PSTN retirement, based on lessons learned in the successful transition from analog to digital television.

4. Retire legacy federal regulations that are unintentionally slowing the transition to all-IP infrastructure and retarding the adoption of broadband, especially among rural and low-income populations.

5. Make clear that Title II regulations will never apply to IP networks.

6. Refrain from asserting Title I ancillary authority to impose mandated interconnection requirements on IP networks, and instead leave interconnection in the hands of the private parties exchanging the traffic.

There has been some progress in achieving these objectives, albeit slow. The National Broadband Plan, in particular, showed vision in urging the Commission to move immediately to accelerate the transition away from circuit-switched networks to native IP.[71] As the Plan noted,

[71] *See Connecting America: The National Broadband Plan*, § 4.5 at p. 59 (2010) ("National Broadband Plan"), *available at* http://download.broadband.gov/plan/national-broadband-plan.pdf.

"[r]egulations require certain carriers to maintain [legacy TDM networks]—a requirement that is not sustainable—and lead to investments in assets that could be stranded."[72]

In creating the Technology Transitions Policy Task Force, the FCC likewise took an important step to encourage the rapid transition "from special purpose to general purpose, from circuit-switched to packet-switched, and from copper to fiber and wireless-based networks."[73] Then-Chairman Genachowski noted at the time:

> Technological transitions don't change the basic mission of the FCC. But technology changes can drive changes in markets and competition. And many of the Commission's existing rules draw technology-based distinctions. So the ongoing changes in our nation's communications networks require a hard look at many rules that were written for a different technological and market landscape.[74]

The point of these farsighted statements is both clear and accurate: Regulators should not pick winners and losers in the broadband ecosystem. But that truism does not mean the Commission should not take action to advance new technologies that are clearly superior.[75] IP networks, in design and implementation, are in every relevant measure exponentially better than PSTN. Lawmakers and regulators should continue to hasten their adoption, focus on making the transition as smooth as possible for all consumers and refrain from placing regulatory impediments in the way of their success.

Some critics of proposed IP transition trials have argued for the continued application of existing regulations (particularly interconnection mandates under Sections 251 and 252 of the Communications Act), arguing that these provisions should apply in a "technology neutral" fashion.[76]

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[72] Id.

[73] FCC, *FCC Chairman Announces Formation of "Technology Transitions Policy Task Force"*, (Dec. 10, 2012), http://www.fcc.gov/document/fcc-chairman-announces-technology-transitions-policy-task-force.

[74] Id.

[75] In nearly every government provision of spectrum in the last hundred years, Congress has clearly picked what it felt were "better" technologies and used policy levers to promote their adoption. Similarly, by excluding broadband Internet access from Title II regulations in the 1996 Communications Act, Congress affirmatively and wisely promoted an unregulated market for IP-based services, and mandated the FCC to do the same. *See*, e.g., Communications Act of 1996, 47 U.S.C. §§ 153(24), 230, 706 (1996). *See also NCTA v. Brand X Internet Services*, 545 U.S. 967 (2005).

[76] *See, e.g.*, Comments of Competitive Carriers Association, *In re AT&T Petition*, GN Docket No. 12-353 (Filed Jan. 28, 2013), *available at* http://apps.fcc.gov/ecfs/document/view?id=7022113646.

According to these critics, "the policy justifications for requiring ILECs to provide interconnection and to submit to arbitration—namely, the ubiquity of ILECs' telecommunications networks and market power that these pervasive networks confer—arise regardless of the technology used by those networks to transmit and exchange telecommunications traffic."[77]

Not only are these complaints irrelevant to the proposed trials (which are small steps aimed at determining precisely *whether* constraints such as Sections 251 and 252 are appropriate), but their alleged policy justification is not, in fact, "technology neutral." Instead, it is a call to apply barnacled rules, crafted over decades specifically for the technology and business realities of the PSTN, to a new ecosystem that shares few, if any, of the same characteristics.

Technology neutrality does not mean blindly enforcing design principles suited for tree houses as buildings codes for steel skyscrapers. Modern structures are clearly better. They require entirely different rules, and different kinds of enforcement. Applying PSTN rules to IP networks is bad business and bad public policy. There are no regulated monopolies in the IP ecosystem, and no need for the kind of regulations aimed at controlling them.

An all-IP-infrastructure is clearly better for everyone. The sooner we can complete the transition, the sooner we will reap the full dividends of continuing private and public investments in this new infrastructure. Getting the transition right will not only save the legacy PSTN operators from irrelevance. It will likely bolster the U.S. economy, accelerate the technological empowerment of Americans as both citizens and consumers, and sustain global competitiveness for U.S. technology companies.

As the National Broadband Plan put it,

> [B]roadband is a foundation for economic growth, job creation, global competitiveness and a better way of life. It is enabling entire new industries and unlocking vast new possibilities for existing ones. It is changing how we educate children, deliver health care, manage energy, ensure public safety, engage government, and access, organize, and disseminate knowledge.[78]

[77] Id. at 3.

[78] National Broadband Plan, *supra* note 14, at xi. *See also* chapters 10-16. *And see* Robert E. Litan and Hal Singer, THE NEED FOR SPEED: A NEW FRAMEWORK FOR TELECOMMUNICATIONS POLICY IN THE 21ST CENTURY (Brookings Institution Press 2013).

In *The Politics of Abundance*, former FCC Chairman Reed Hundt and his one-time chief of staff Blair Levin make a persuasive case that the shift to "connected computing"—broadband Internet, cloud-based services, and widespread mobile devices—is essential to jumpstart the U.S. economy. Hundt and Levin urge all levels of government to take immediate steps to support what they call the "knowledge platform"—ultra high-speed broadband with high reliability and low latency, able to support high-bandwidth, video-intensive applications and cloud-based services.

As Hundt and Levin write, "[t]o increase growth, job creation, productivity gains, and exports at a faster rate, government should double down on what is already doubling in the Internet sector."[79] They point, for example, to the fact that Internet transit prices have improved as much as 50% each year. (See Figure 1)

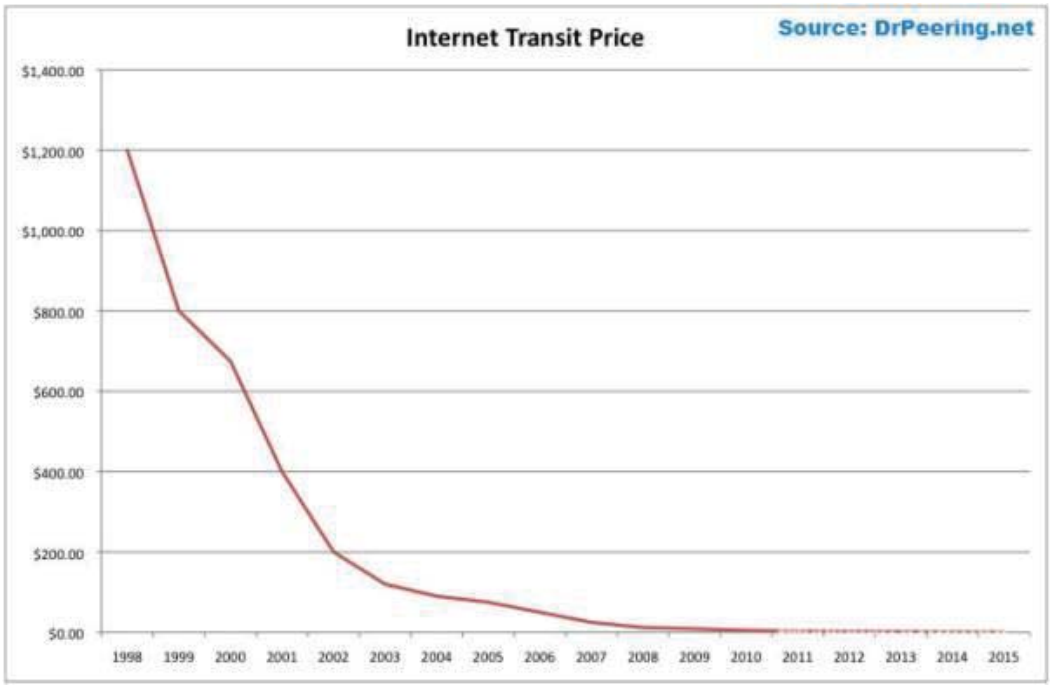

Figure 1 – Internet Transit Price per 1 Mbps, 1998-2015
Source: Hundt & Levin, supra note 22, Figure 2.1, p. 105

[79] Reed Hundt & Blair Levin, THE POLITICS OF ABUNDANCE: HOW TECHNOLOGY CAN FIX THE BUDGET, REVIVE THE AMERICAN DREAM, AND ESTABLISH OBAMA'S LEGACY 9 (2012), 16-17.

The kind of high-speed, widely accessible and affordable broadband Hundt and Levin describe also provides the tools that innovators need to launch more Big Bang Disruptions. All-IP networks will vastly expand the possibilities of the next generation of cloud services like Google, Facebook, Twitter and Salesforce. These services and others that will follow will be superior in ways both easily imaginable (instant, more reliable interaction with richer media like video, streaming presentations, and more robust tools) but also in ways that we cannot yet imagine.

Preserving Peer-Based Interconnection

The IP Transition will accelerate the ongoing transformation of our digital experiences in ways that could be as revolutionary as the introduction of the Internet itself. It is imperative that government, private sector companies, and consumers work together to get it done as quickly as possible.

Government, in particular, should work to undo much of the regulatory mess that unnecessarily constrains legacy PSTN providers as they transition to IP. For example, Congress and the FCC should reject self-serving calls to impose outdated regulations mandated network interconnection, devised for an era of monopoly voice carriage, on the well-functioning market for private Internet peering agreements, which already ably provides for voice as well as video and data traffic management.

Private peering arrangements have long provided an efficient mechanism for interconnection on packet-switched networks, regardless of whether the packets contain data, video, and voice applications. The shutdown of PSTN networks and the migration of additional voice traffic to the Internet do not change the dynamics of that system. As Michael Kende, former Director of Internet Policy Analysis at the FCC has recently written:

> [T]he competitive concerns that historically drove interconnection regulations for PSTN-based voice service are no longer valid due to the rapid take-up of many different types of alternative communications services to traditional voice, such as cable telephony, software-based voice over IP (VoIP), and other IP-based forms of communications. Therefore, as voice migrates to the Internet there is no need for any regulation of IP voice traffic which mirrors the regulation of the PSTN on

competition grounds, because the current IP interconnection arrangements show how traffic will flow end-to-end without a regulatory mandate.[80]

Today, marketplace and reputational incentives drive interconnection and consumer protections. These incentives are buttressed by various multistakeholder processes that continue to evolve to supplement direct company-to-company dispute resolution.[81] At the same time, the FCC retains authority under Title I of the Communications Act to regulate for public safety, and antitrust and consumer protection laws govern IP services precisely because they are not regulated as common carriers (which are excluded from the FTC's general jurisdiction over the economy).[82]

If significant issues do arise in the IP transition that escape these multiple layers of regulatory and governance constraints, Congress can of course enact legislation appropriately targeted to address clear consumer harms. But narrowly tailored legislation from Congress after the IP transition has evolved of its own accord is the proper mechanism for addressing such issues—not by bringing the dead weight of old regulatory baggage to new markets.

Not surprisingly, several parties in the FCC's on-going IP transition proceedings have urged the agency to transplant legacy interconnection requirements on IP networks as part of the retirement of the PSTN. PSTN interconnection requirements, however, were formulated when the Bell System was a true, regulated monopoly. They were a necessary evil to control monopolistic risks, and they have imposed considerable waste, fraud and unnecessary cost in exchange for that benefit. Consider, for example, recent FCC reforms of intercarrier compensation aimed at reducing such interconnection arbitrage as traffic pumping, phantom traffic and other abuses.[83]

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[80] Michael Kende, *Voice Traffic Exchange in an IP World*, Analyses Mason, April 12, 2013, at 2.

[81] Most notable among these is the Broadband Internet Technical Advisory Group (BITAG), "a technical advisory group to discuss and opine on technical issues pertaining to the operation of the Internet, as a means of bringing transparency and clarity to network management processes as well as the interaction among networks, applications, devices and content." BITAG History, http://www.bitag.org/bitag_organization.php?action=history (last visited February 25, 2013).

[82] *See* Federal Trade Commission, Broadband Connectivity Competition Policy, 3 (2007), *available at* http://www.ftc.gov/reports/broadband/v070000report.pdf ("[FTC] jurisdiction [over broadband Internet access services] had once been regarded as limited to the extent that the FTC's general enforcement authority under the FTC Act did not extend to entities that were 'common carriers' under the Communications Act. The regulatory and judicial decisions at issue, however, confirmed that the larger categories of broadband Internet access services, as information services, are not exempt from FTC enforcement of the FTC Act.").

[83] Report and Order and Further Notice of Proposed Rulemaking, *In re* Developing a Unified Intercarrier Compensation Regime, CC Docket No. 01-92 (November 18, 2011), *available at* http://www.fcc.gov/document/fcc-releases-connect-america-fund-order-reforms-usficc-broadband.

In the IP world, by contrast, network operators worldwide negotiate all manner of peering agreements absent any regulation. Indeed, peering within the IP network is so easily achieved, as the OECD has pointed out, that "the terms and conditions of the Internet interconnection model are so generally agreed upon that 99.5% of interconnection agreements are concluded without a written contract."[84] Simply put, there is no evidence that anything is broken in the IP network ecosystem.

Those asking regulators to invent an IP interconnection regulatory scheme for voice (or perhaps for all Internet traffic) invoke public interest concerns, but the real motivation is simple rent-seeking. Smaller carriers prefer below-market rates for backhaul, and CLECs are eager to protect their subsidized business model in new ecosystems that are already highly competitive. But these desires have nothing to do with consumer harms, let alone the public interest. In any case, the FCC should avoid "prophylactic" regulations for interconnection problems that, as even those asking for them admit, are speculative.

That Internet peering works so well absent regulation is no surprise. Major ISPs have strong business incentives to interconnect. For example, ISP customers increasingly demand access to streaming video content from services such as Netflix and Amazon, and ISPs know that streaming video is the primary reason that customers are willing to pay for high-speed broadband connections at home.

Where disputes have arisen (often around the distinction between settlement-free transit vendors and paid-peering content delivery networks (CDN), for example[85]), they have taken the form of contract disputes between large commercial players over *the specific terms* of interconnection, not *whether* it will be available.

Moreover, demand for streaming video has become so strong that Netflix, having established its own CDN, can now sidestep such disputes and pressure ISPs to accede to its peering demands by threatening to withhold new content or services. It has now *content providers*, in other words,

[84] OECD, Committee for Information, Computer and Information Policy, Internet Traffic Exchange: Market Developments and Policy Changes, 3 (June, 2011), *available at* http://search.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DSTI/ICCP/CISP(2011)2/FINAL&docLanguage=En.

[85] *See, e.g.*, Marguerite Reardon, *Understanding the Level 3-Comcast spat (FAQ)*, C-Net (November 30, 2010), *available at* http://news.cnet.com/8301-30686_3-20024197-266.html.

and not ISPs, who threaten to withhold traffic.[86] The newfound market power of content providers—as well as increasing intermodal competition from mobile broadband—upends the weathered assumption that ISPs hold all of the bargaining power in interconnection negotiations.

Lessons from the Digital Television Transition

In encouraging the rapid transition of wireline providers to all-IP networks, Congress should heed the lessons of the earlier transition from analog to digital television (DTV). The DTV experience underscores the importance of accelerating deregulation of obsolete networks before consumers abandon them, of setting and sticking to a date certain, and to avoiding the temptation to prophylactically regulate for consumers harms that have yet to appear.

At its height in the 1970's, 93% of all American homes relied on antennas. But analog broadcast couldn't compete with the quality or the quantity of cable channels. As digital technology expanded the scope and efficiency of cable and later fiber-based programming, it became clear that over-the-air broadcasters would likewise need to convert to digital signals to compete.

Shutting down analog broadcast, however, required government coordination. In 1996, Congress mandated the conversion from analog to digital broadcast in 1996, setting a deadline of 2006 and authorizing the FCC to coordinate the transition.

The coordinated switch to DTV was intended to make the highly-regulated broadcasters more competitive with the relatively unregulated cable industry.

How? Digital TV lowered costs and created new opportunities for broadcasters. As part of the transition, for example, broadcasters traded their analog radio spectrum allocations in the 700 MHz band for a new 6 MHz block in the 600 MHz band. Because digital signals are more compressed, each 6 MHz block could be split and used for multiple channels, all of them capable of high-definition broadcast, as well as new mobile business opportunities for the broadcasters.

[86] *See, e.g.*, Betsy Isaacson, *Netflix Says 3D and 'Super-HD' Movies Are Just Around The Corner--But Only For Some Customers*, Huffington Post (January 9, 2013), *available at* http://www.huffingtonpost.com/2013/01/09/netflix-3d-movies_n_2441394.html; Fred Campbell, *Netflix Blocking Internet Access to HD Movies*, The Technology Liberation Front (January 17, 2013), *available at* http://techliberation.com/2013/01/17/netflix-blocking-internet-access-to-hd-movies/; Fred Campbell, *What Does Netflix's Decision to Block Internet Content Tell Us About Internet Policy?*, The Technology Liberation Front (January 23, 2013), *available at* http://techliberation.com/2013/01/23/what-does-netflixs-decision-to-block-internet-content-tell-us-about-internet-policy/.

So far, however, few station operators have been able to make use of that capacity to offer extra channels or to repurpose underutilized spectrum for mobile or other premium services. That's largely because, in the end, the DTV transition was delayed until 2009. By then, over-the-air television had already entered an unrecoverable dive in viewership and revenue.[87] According to research from the Consumer Electronics Association, the decline in over-the-air audience became irreversible between 2005, when the transition should have happened, and 2009, when it finally did.[88]

Delays in the DTV transition were largely the result of unfounded and exaggerated fears that some consumers would not be ready in time. A 2006 article in *Fortune*, for example, warned breathlessly that the DTV transition would "render about 70 million TV sets obsolete," and that "for consumers with one of those 70 million sets -- many of whom are likely to be poor, elderly or uneducated, being forcibly switched from one technology to another will be a nightmare."[89]

The reality, of course, was very different. Consumers who weren't already cable or satellite subscribers and whose energy-inefficient tube television sets were too old to receive digital signals were barely inconvenienced, let alone "forcibly switched."

Many had already moved to cable or satellite by the time the DTV transition occurred. For the rest, all they had to do was to buy and attach small digital converter boxes to their old TVs. Under a plan implemented by the Department of Commerce, consumers could even apply for up to two $40 coupons with which to purchase the converters, funded by proceeds from the 700 MHz spectrum auctions.

On the fateful day, June 12, 2009, according to Nielsen, almost no one was left without television service. As Figure 2 shows, nearly all "unready homes" had successfully made the transition by using the converter box, or by switching to digital cable or satellite. No television was rendered "obsolete," let alone 70 million.[90]

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[87] *See* Sam Schechner and Rebecca Dana, *Local TV Stations Facing a Fuzzy Future*, THE WALL STREET JOURNAL, Feb. 10, 2009, *available at* http://online.wsj.com/article/SB123422910357065971.html.
[88] *CEA Study: Consumers are Tuning Out Over-the-Air TV*, May 31, 2011, *available at* http://www.ce.org/News/News-Releases/Press-Releases/2011-Press-Releases/20110531-CEA-Study-Consumers-Are-Tuning-Out-Over-t.aspx.
[89] Marc Gunther, *Digital TV: Leaving Viewers in Limbo*, FORTUNE, Jan. 19, 2006, *available at* http://money.cnn.com/2006/01/04/technology/pluggedin_digitaltv/index.htm.
[90] Nielsen, *The Switch from Analog to Digital TV*, Nov. 2, 2009, *available at* http://www.nielsen.com/us/en/newswire/2009/the-switch-from-analog-to-digital-tv.html.

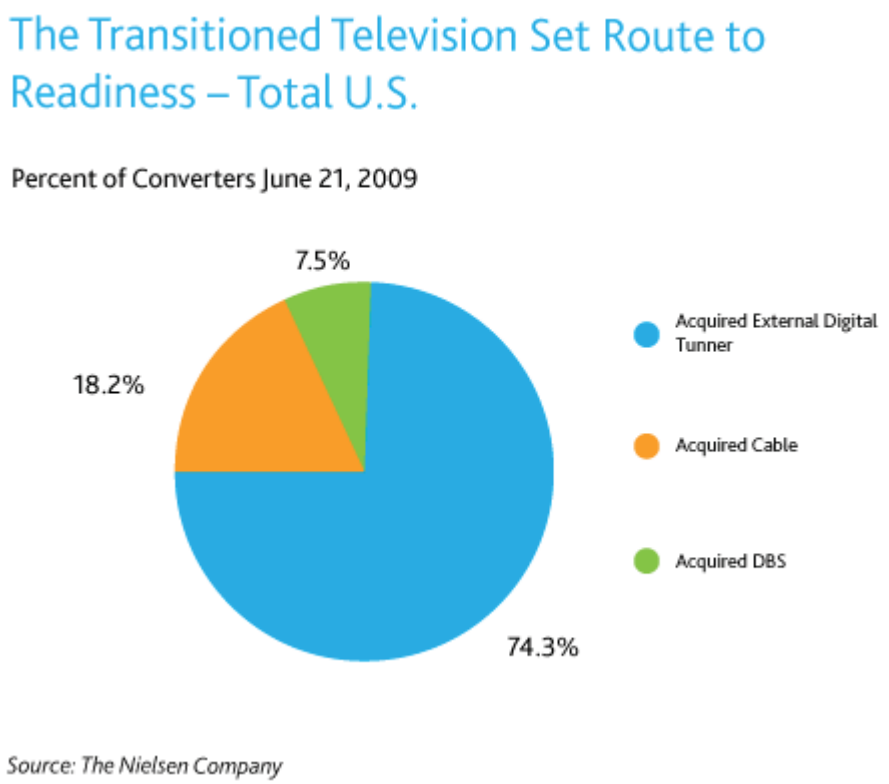


Figure 2 – Consumers Adapted to the DTV Conversion

Delaying the transition by three years, however, blunted the potential of a coordinated and timely switchover in crucial ways. Consumers had more time to switch to cable or satellite to avoid dealing with the transition at all, imposing real damage on broadcasters. That loss of viewers makes it harder to this day for the broadcasters to offer new and competing products using their new spectrum and digital technology upgrades.

Ultimately, that translates to a loss to consumer of more competition in the video marketplace. Delays that were intended to protect consumers, in the end, did just the opposite.

The IP transition should be easier. Unlike digital television, consumers will not need to replace equipment already in their homes, nor will they need to install adapters for existing telephones. In some cases, fiber optic cable will replace copper wiring in the heart of the network; in other cases, fiber will be run directly to the home. But inside wiring will not be affected, and existing telephones (far cheaper to replace, in any case, than old analog televisions)

will continue to operate, just as they do now in homes that have already switched to Internet voice services.

It is true that some rural users may need to switch from landline to mobile service, especially in remote areas where the cost of installing wired IP networks is prohibitive. But the FCC can subsidize the cost of that switch—as indeed it already does through the recently-reformed Universal Service Fund.[91]

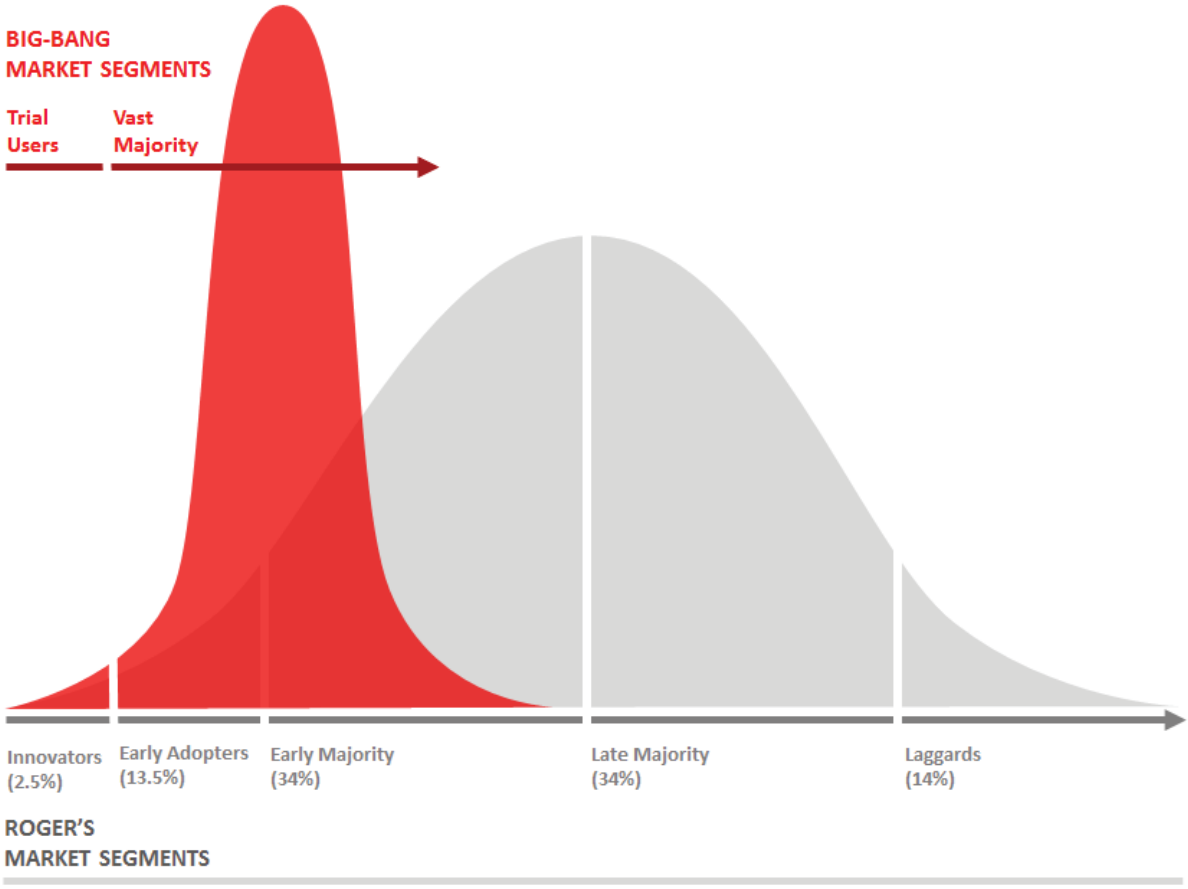
As with DTV transition, however, ungrounded fears of what could go wrong could continue to delay the IP transition, with dangerous and unintended consequences for consumers--particularly those for whom advocates most claim to be looking out.

Conclusion

Consumers naturally resist change, even when being offered new products and services that are better and cheaper. But where the introduction of new technologies once required careful planning by providers and different marketing delivered to different groups of users, research on Big Bang Disruptions reveals that the process has changed dramatically. The old bell curve model of technology adoption first described by Everett Rogers is gone, replaced by a much steeper curve in which adoption is nearly universal and immediate. The Internet revolution has compressed the old categories to just two: early users, and everyone else.[92] (See Figure 3.)

[91] *See* Marguerite Reardon, *FCC Reforms Phone Subsidy Program for the Poor,* CNET NEWS.COM, Jan. 31, 2013, *available at* http://news.cnet.com/8301-30686_3-57369007-266/fcc-reforms-phone-subsidy-program-for-the-poor/.

[92] *See* Downes and Nunes, *Big Bang Disruption, supra* note 4, at 47.



*(*Source*: Downes and Nunes,* supra note 4*, at* 47*)*

Figure 3 – The New Model of Technology Adoption

The adoption of IP-based voice services is following the new model, and its impact on wireline competition has already been devastating. Congress and the FCC must act to preserve the residual value of the PSTN and ease the transition for those Americans who have yet to make the leap.

Some consumers will no doubt encounter problems in the final transition from PSTN networks. Some of these issues will be addressed by more technology or, where truly necessary, by regulatory intervention. But as with the DTV transition, the real problems will likely turn out to be far less imposing, and visited on far fewer consumers, than pre-transition anxiety suggests. That of course is the reason to conduct trials in the first place: to unearth and resolve as many potential issues as possible, and to make clear where problems do not in fact exist.

In the DTV transition, broadcasters set free too late to make use of their new competitive technologies are now limping into extinction.

If we don't get the IP transition right, the same fate could be unnecessarily visited on incumbent PSTN network operators. But in the end, as before, it will be consumers who pay the price for that failure.